MAP MF—1730

DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

MAPS SHOWING COAL RESOURCES OF THE AMONATE QUADRANGLE, BUCHANAN AND TAZEWELL COUNTIES, VIRGINIA AND McDOWELL COUNTY, WEST VIRGINIA

By John F. Windolph, Jr.

NEW YORK
JUN 6 1989
STATE LIBRARY

MISCELLANEOUS FIELD STUDIES MAP
Published by the U.S. Geological Survey, 1986

WINDOLPH—COAL RESOURCES OF THE AMONATE QUAD., VIRGINIA AND WEST VIRGINIA   MAP MF—1730

DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

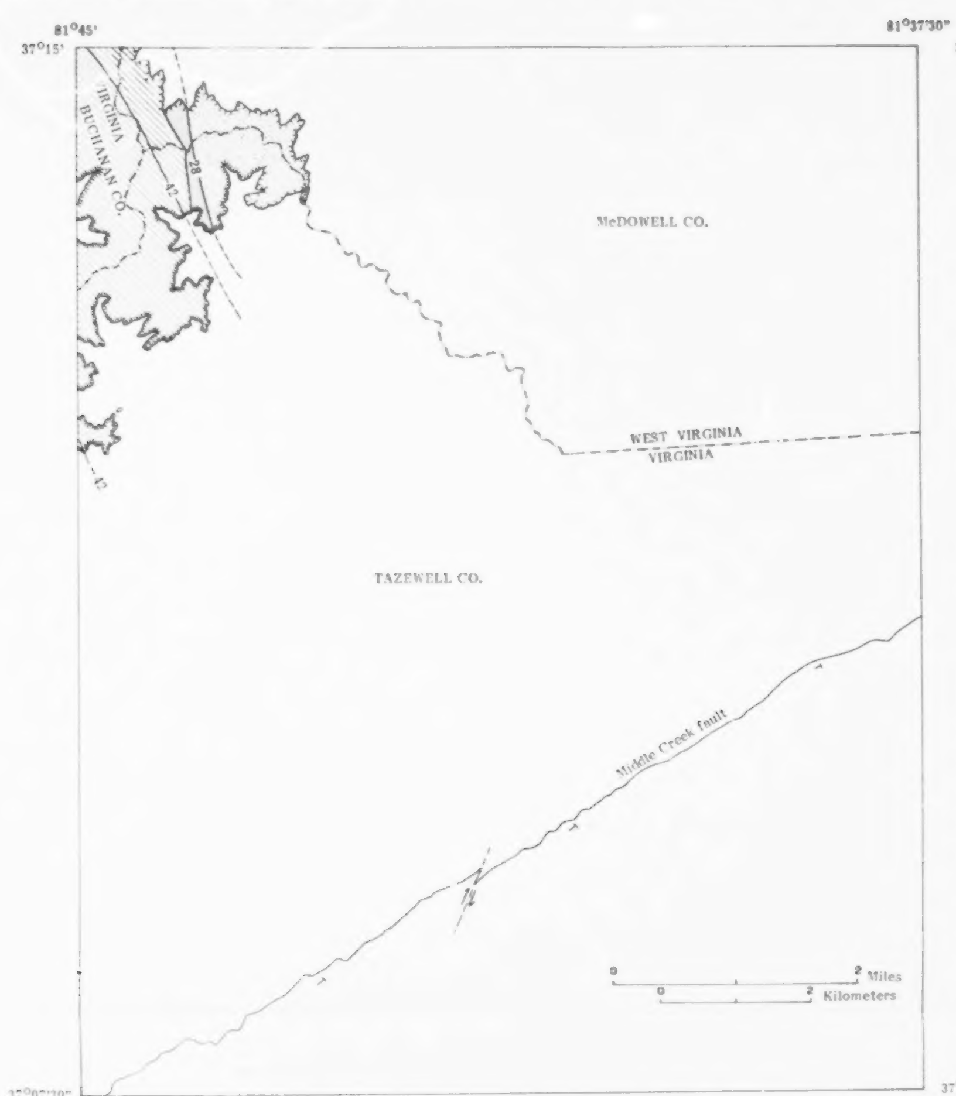


Figure 1.--Distribution of the Jewell coal bed.

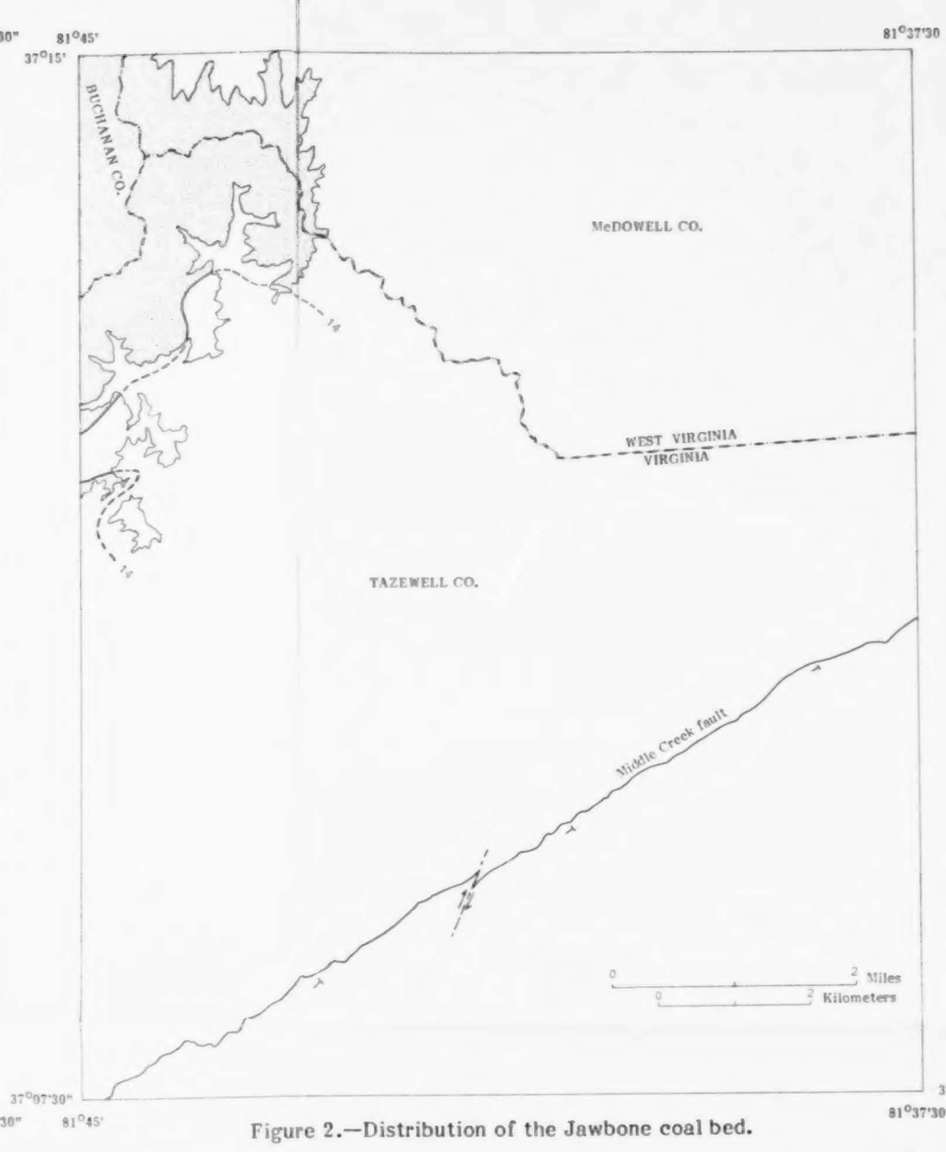


Figure 2.--Distribution of the Jawbone coal bed.

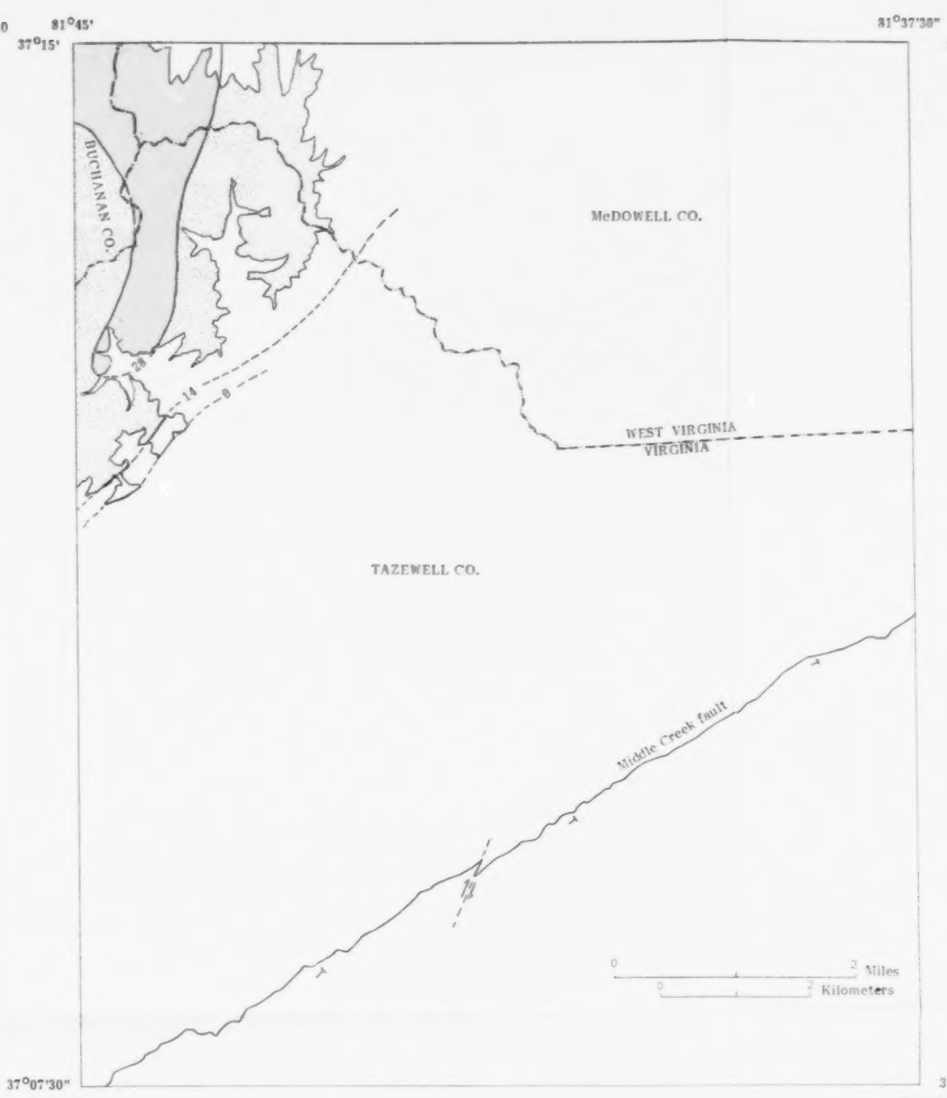


Figure 3.--Distribution of the Tiller coal bed.

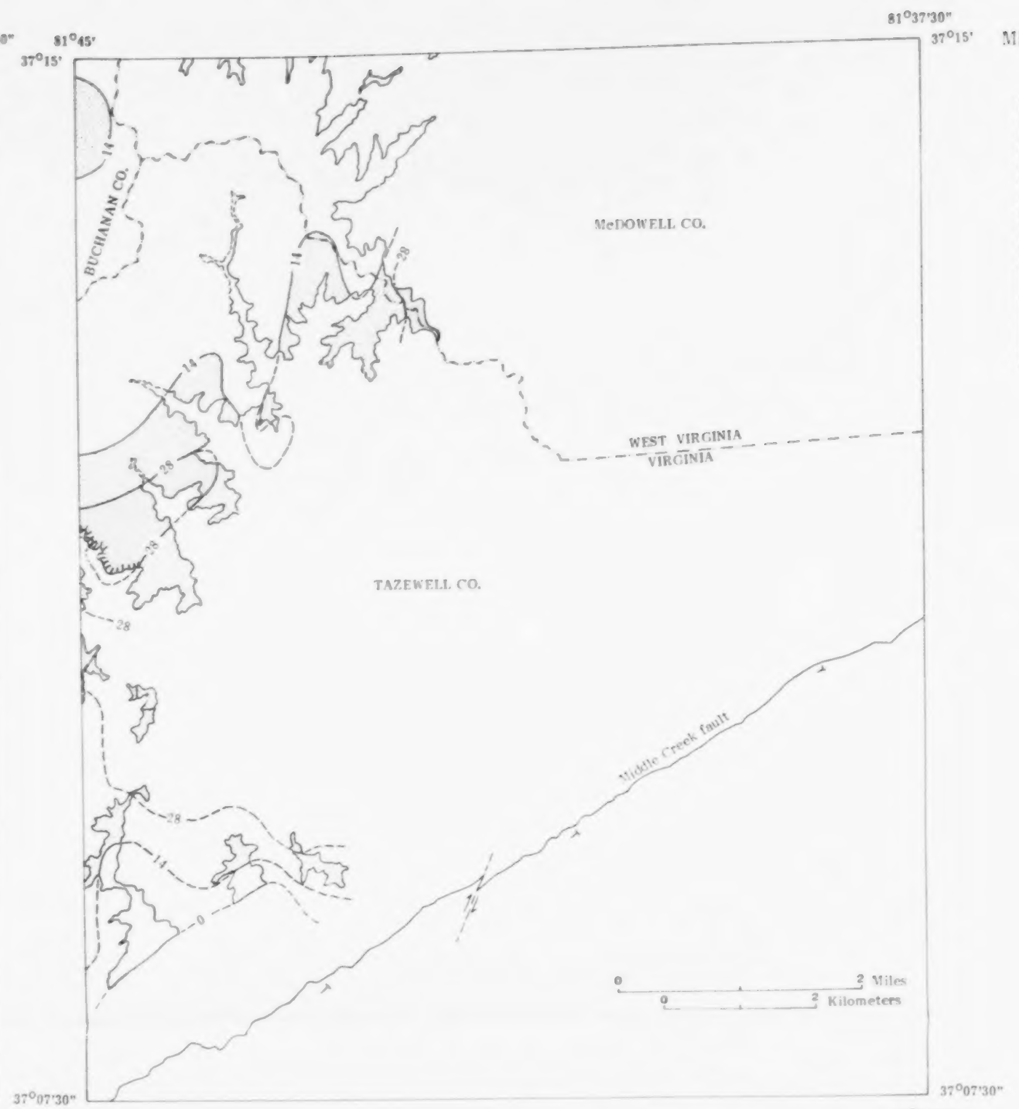


Figure 4.--Distribution of the Upper Seaboard coal bed.

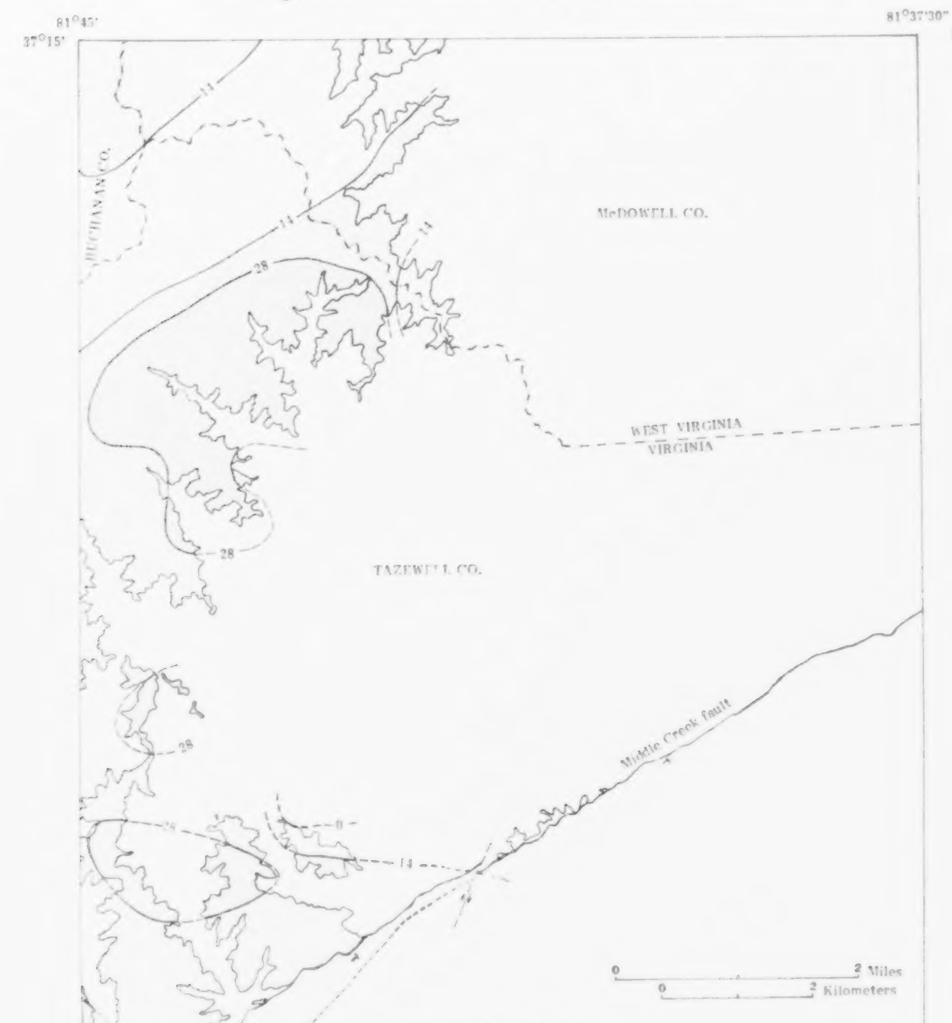


Figure 5.--Distribution of the Middle Seaboard coal bed.

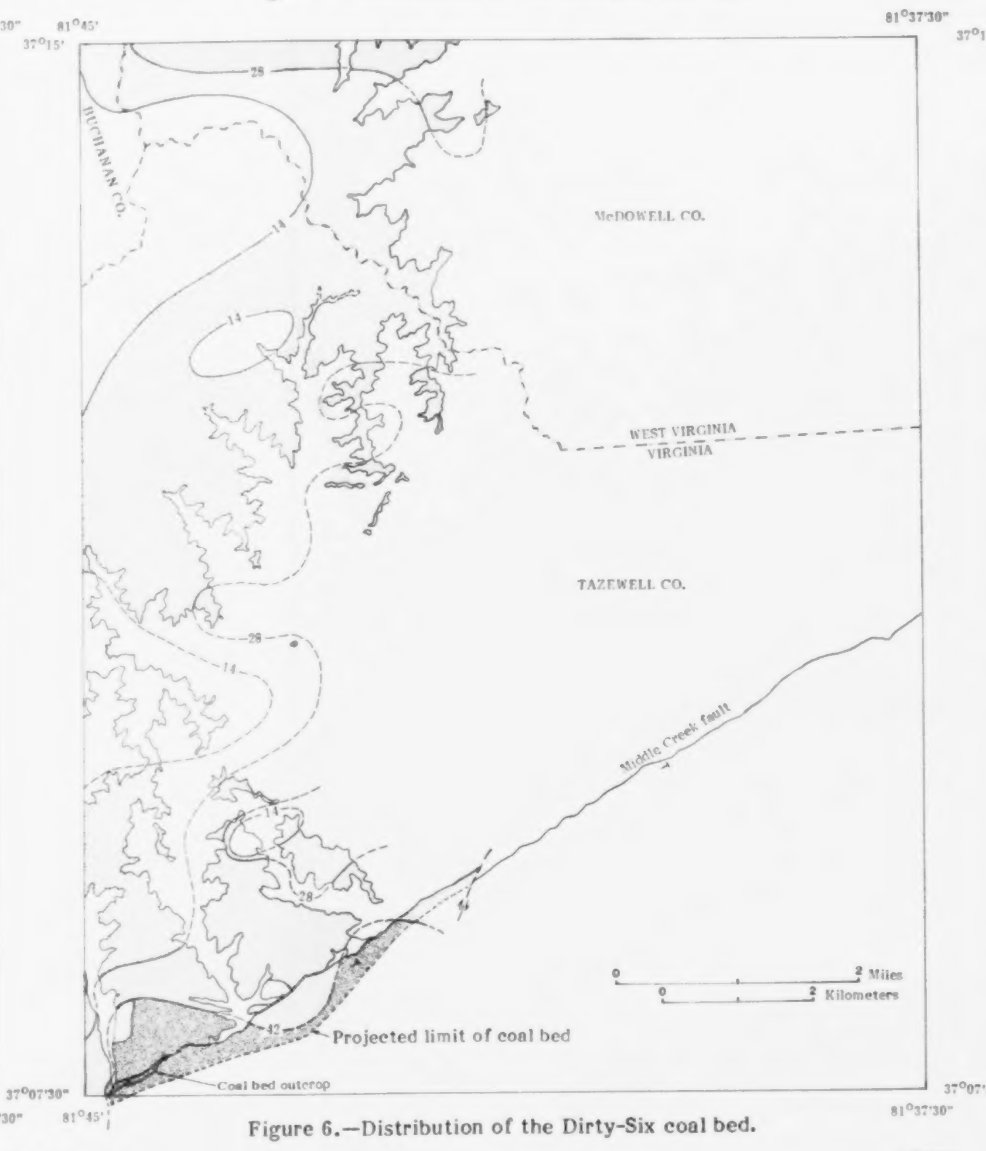


Figure 6.--Distribution of the Dirty-Six coal bed.

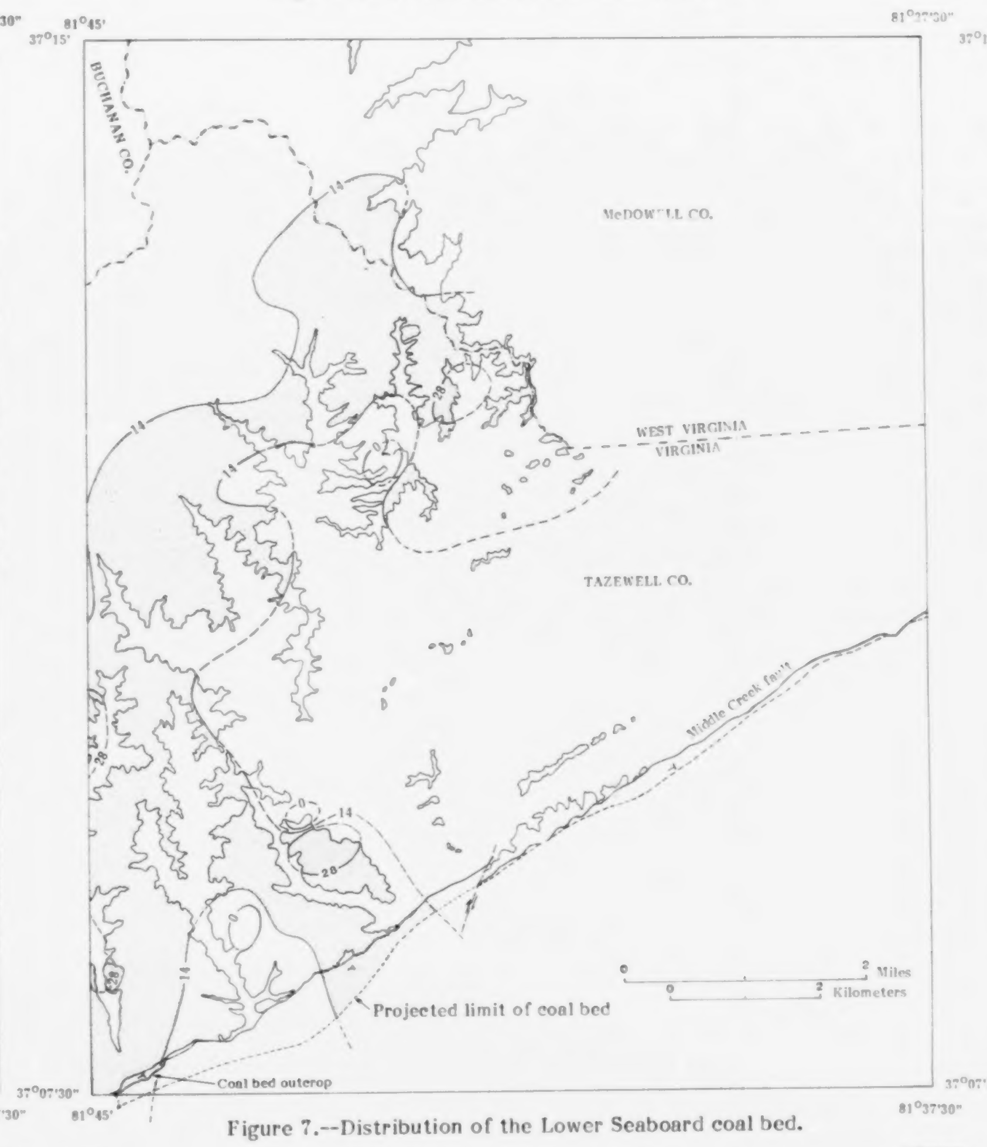


Figure 7.--Distribution of the Lower Seaboard coal bed.

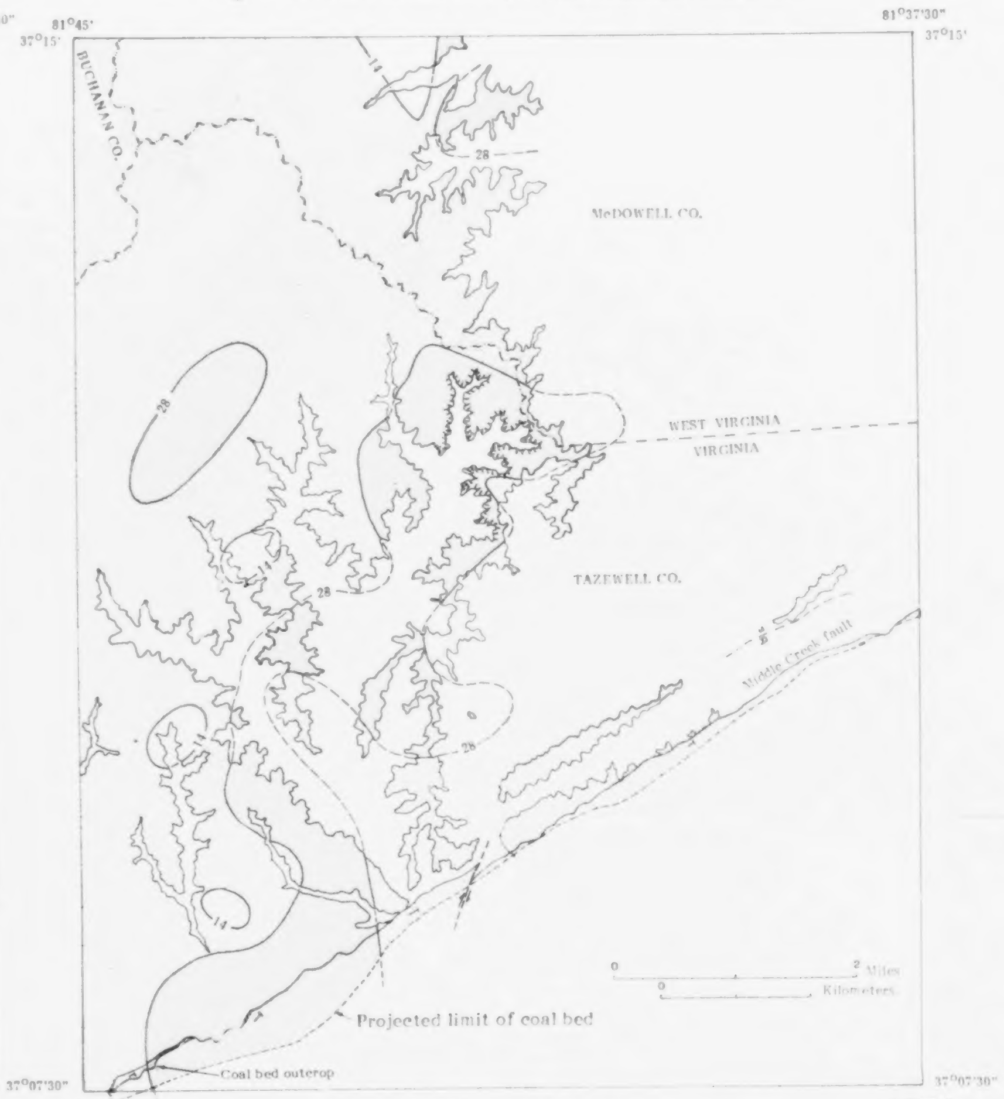


Figure 8.--Distribution of the Sewell(?) coal bed.

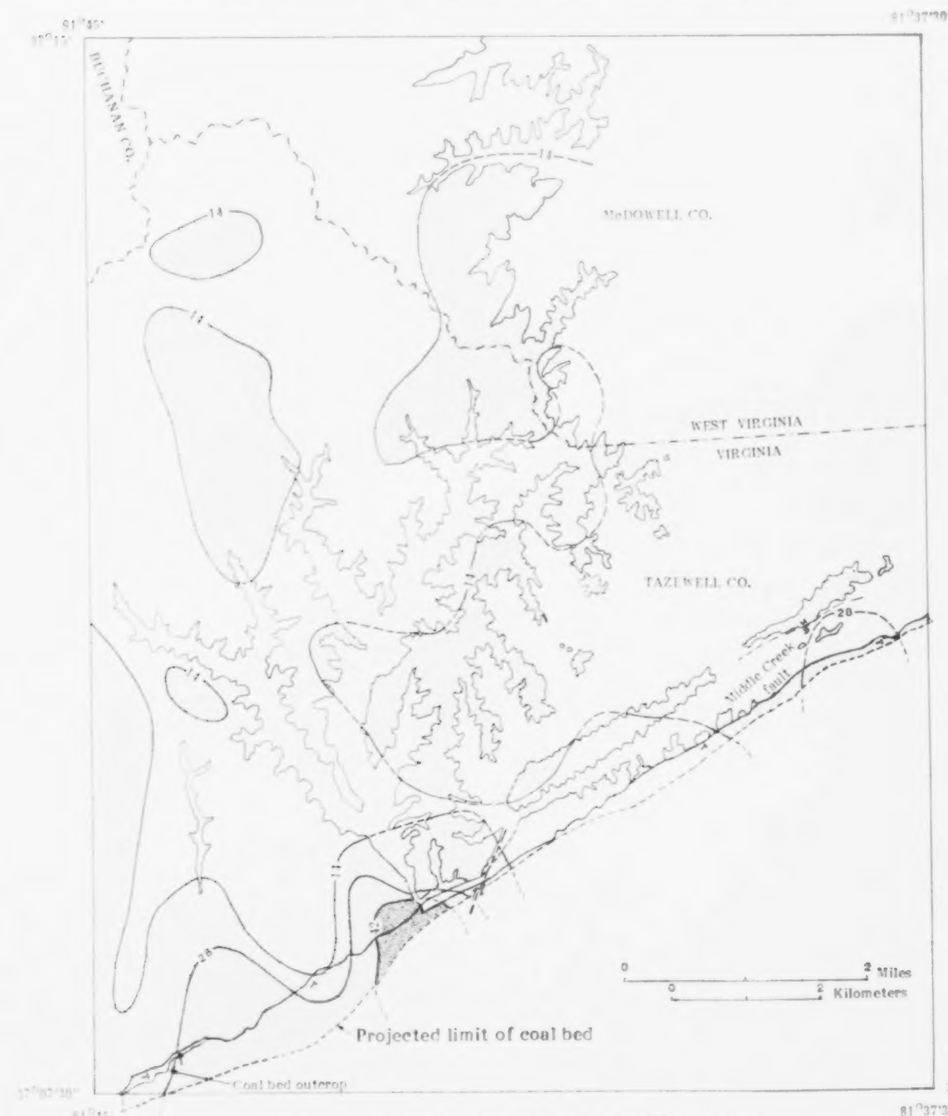


Figure 9.--Distribution of the Welch(?) coal bed.

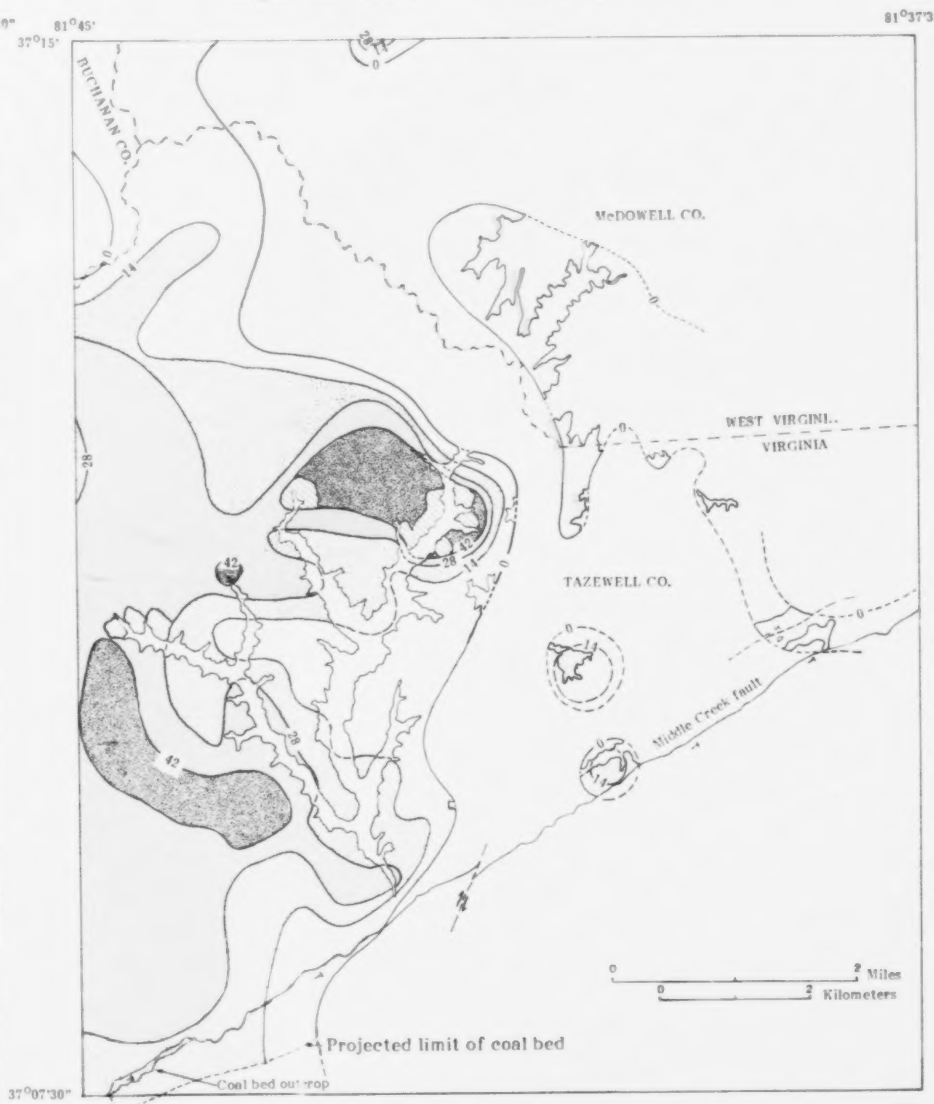


Figure 10.--Distribution of the Upper Horsepen (Upper Split) coal bed.

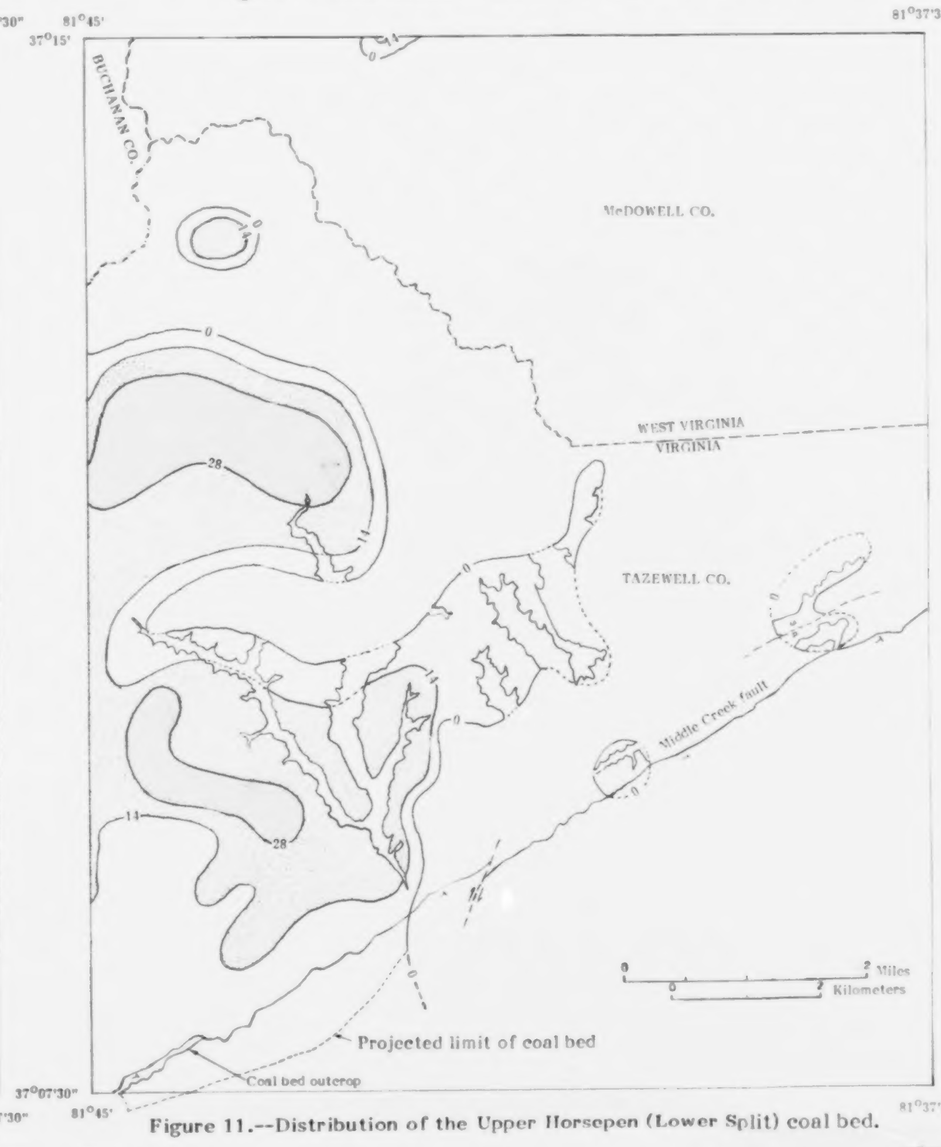


Figure 11.--Distribution of the Upper Horsepen (Lower Split) coal bed.

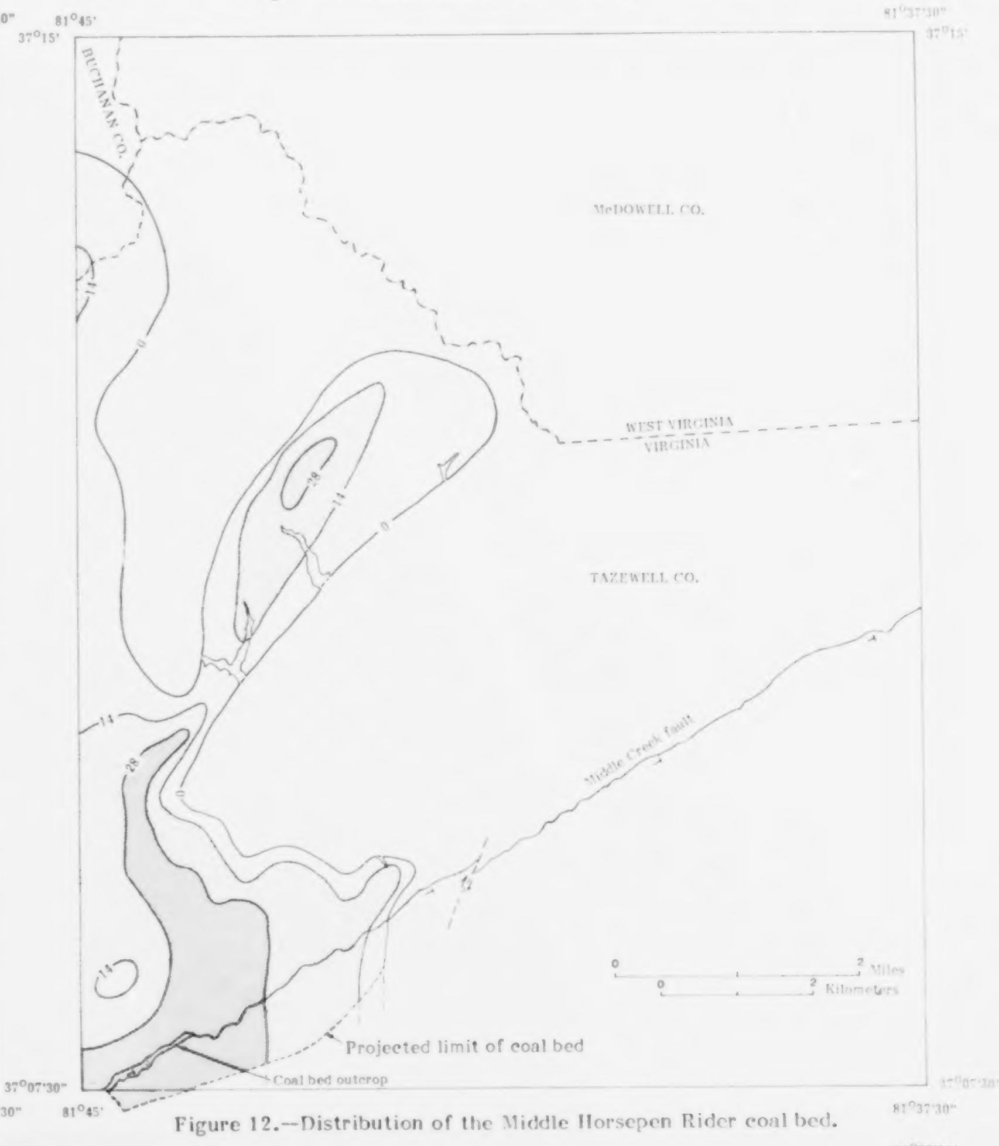


Figure 12.--Distribution of the Middle Horsepen Rider coal bed.

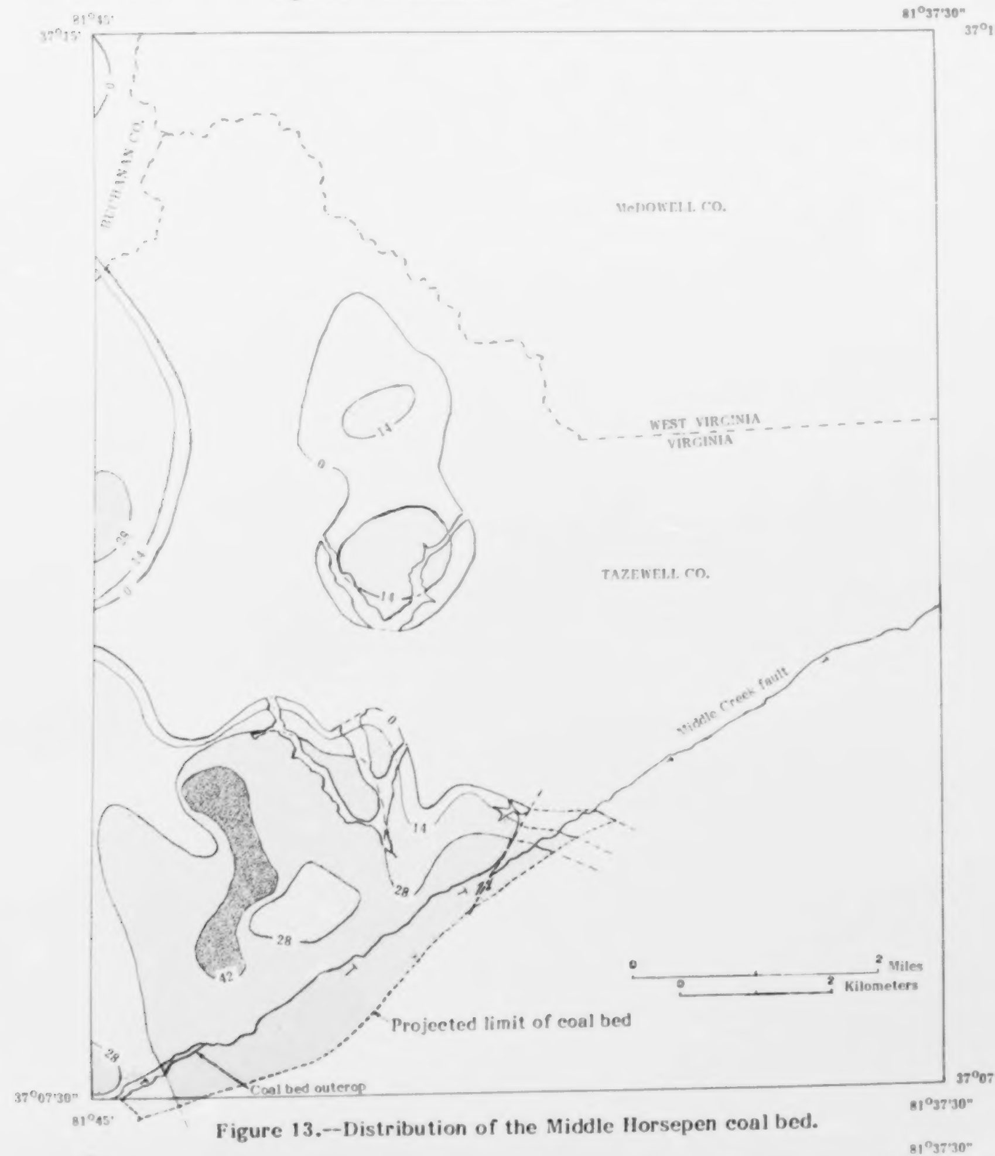


Figure 13.--Distribution of the Middle Horsepen coal bed.

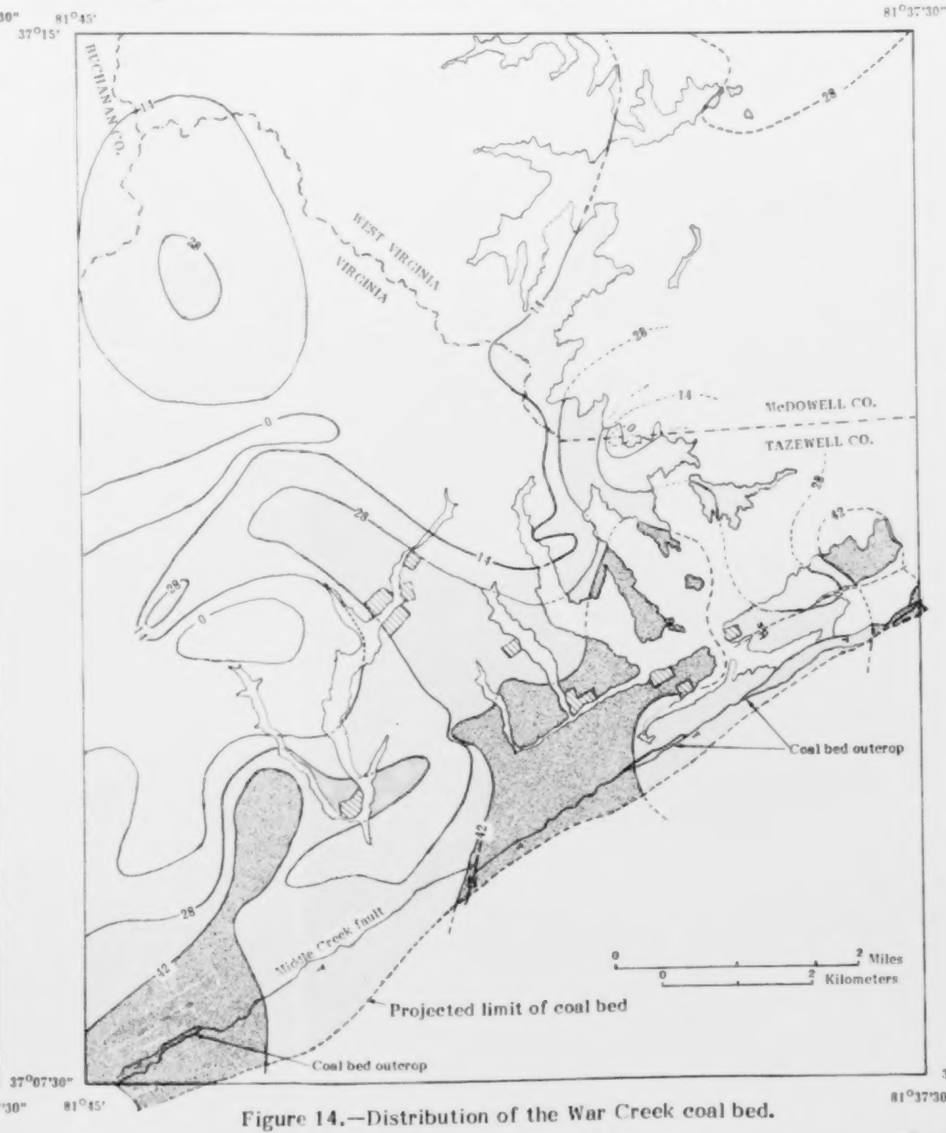


Figure 14.--Distribution of the War Creek coal bed.

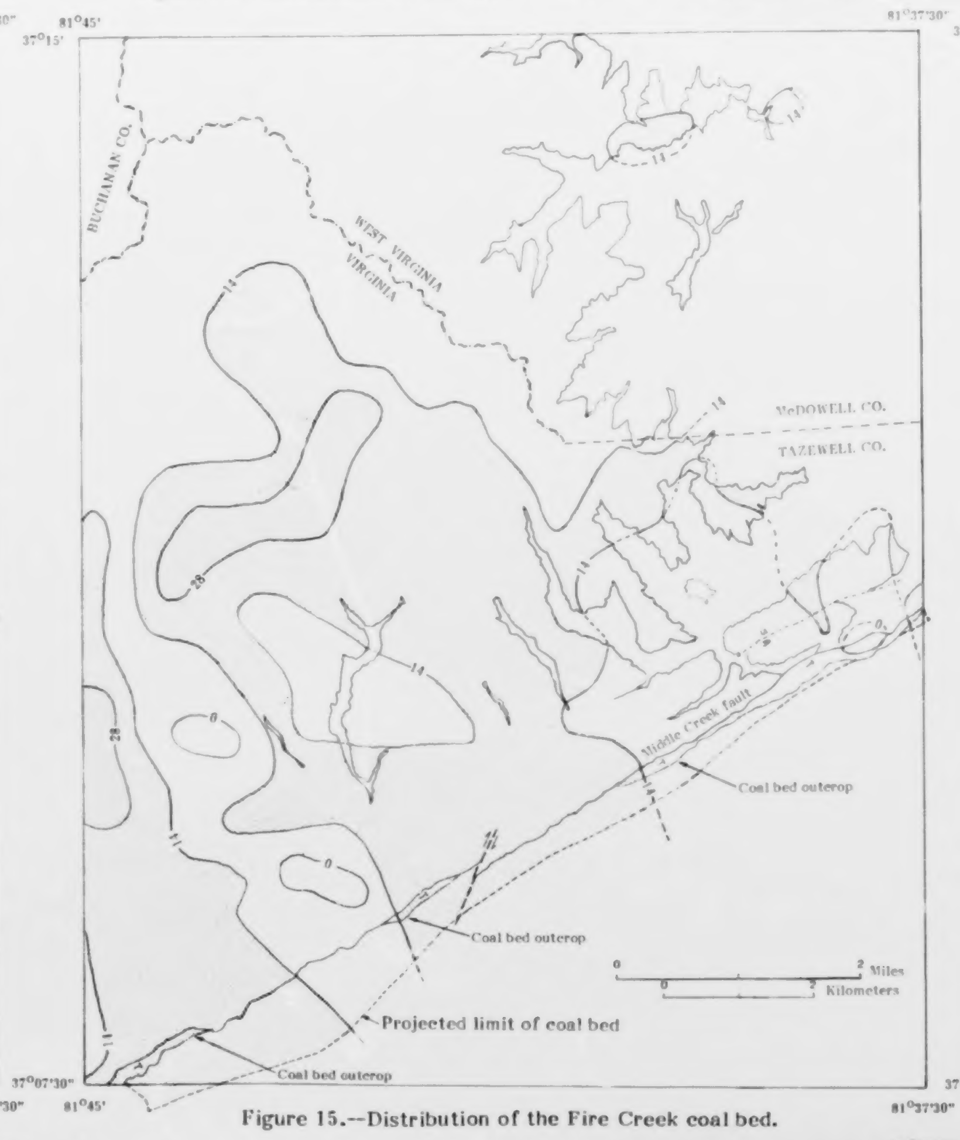


Figure 15.--Distribution of the Fire Creek coal bed.

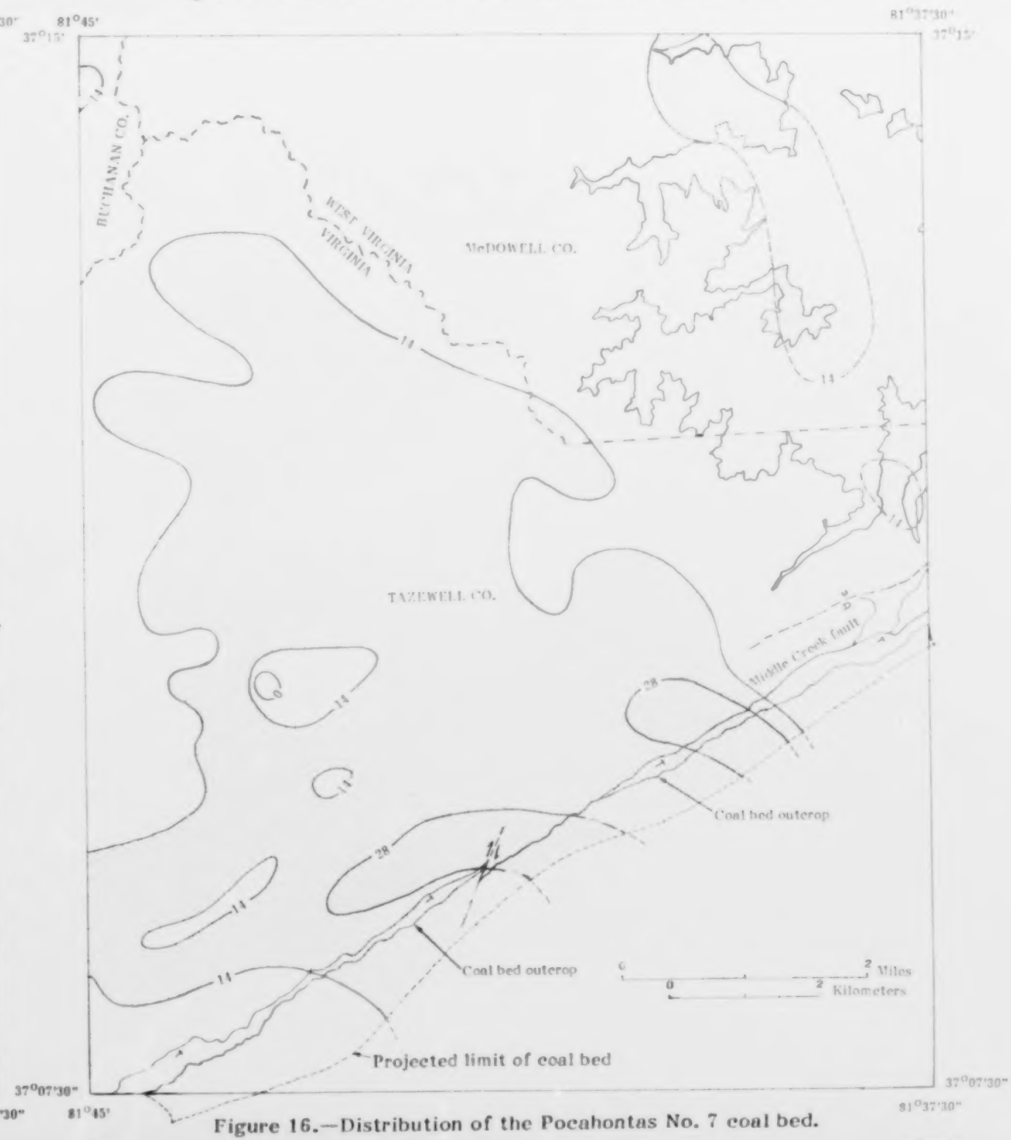


Figure 16.--Distribution of the Pocahontas No. 7 coal bed.

MISCELLANEOUS FIELD STUDIES
MAP MF–1730

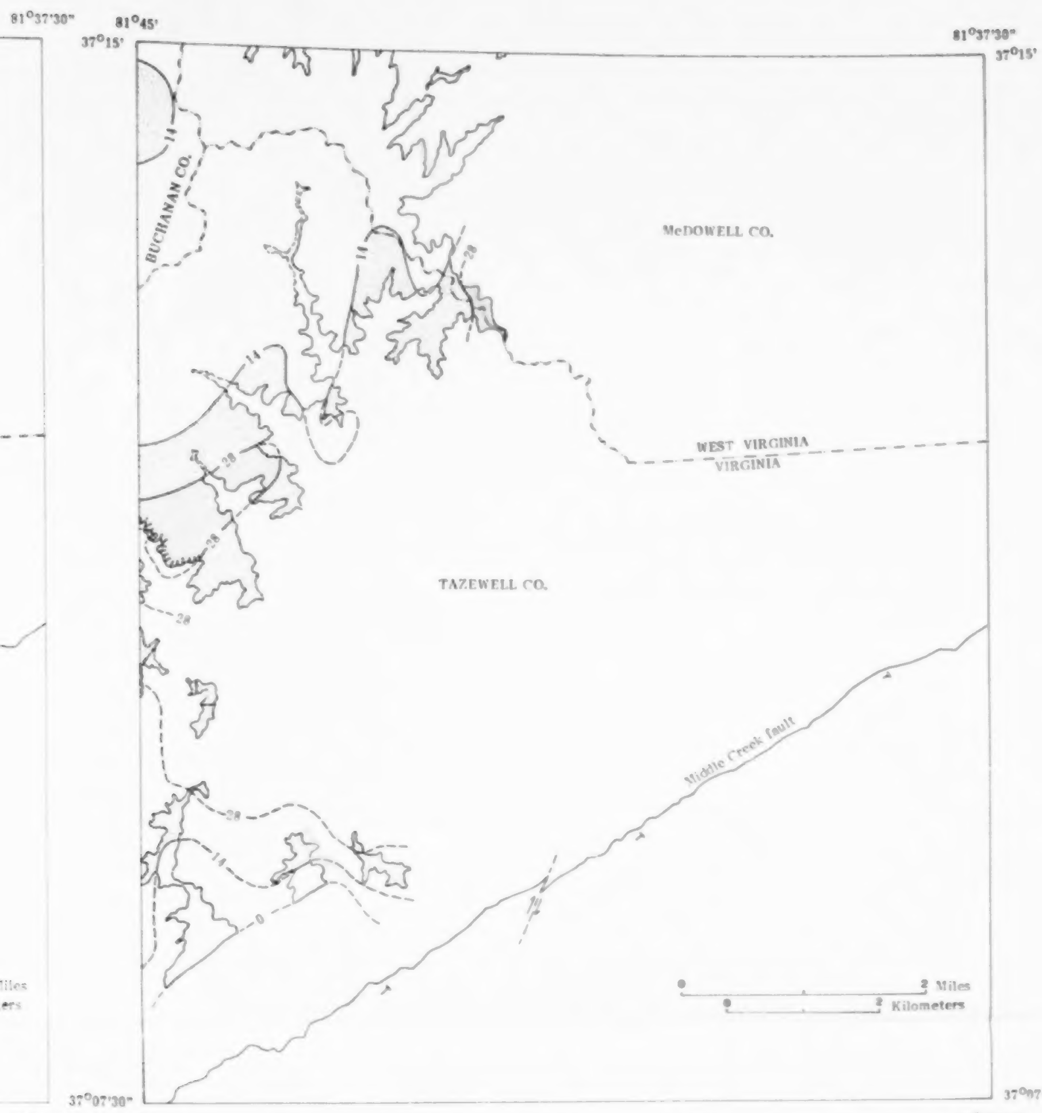


Figure 4.--Distribution of the Upper Seaboard coal bed.

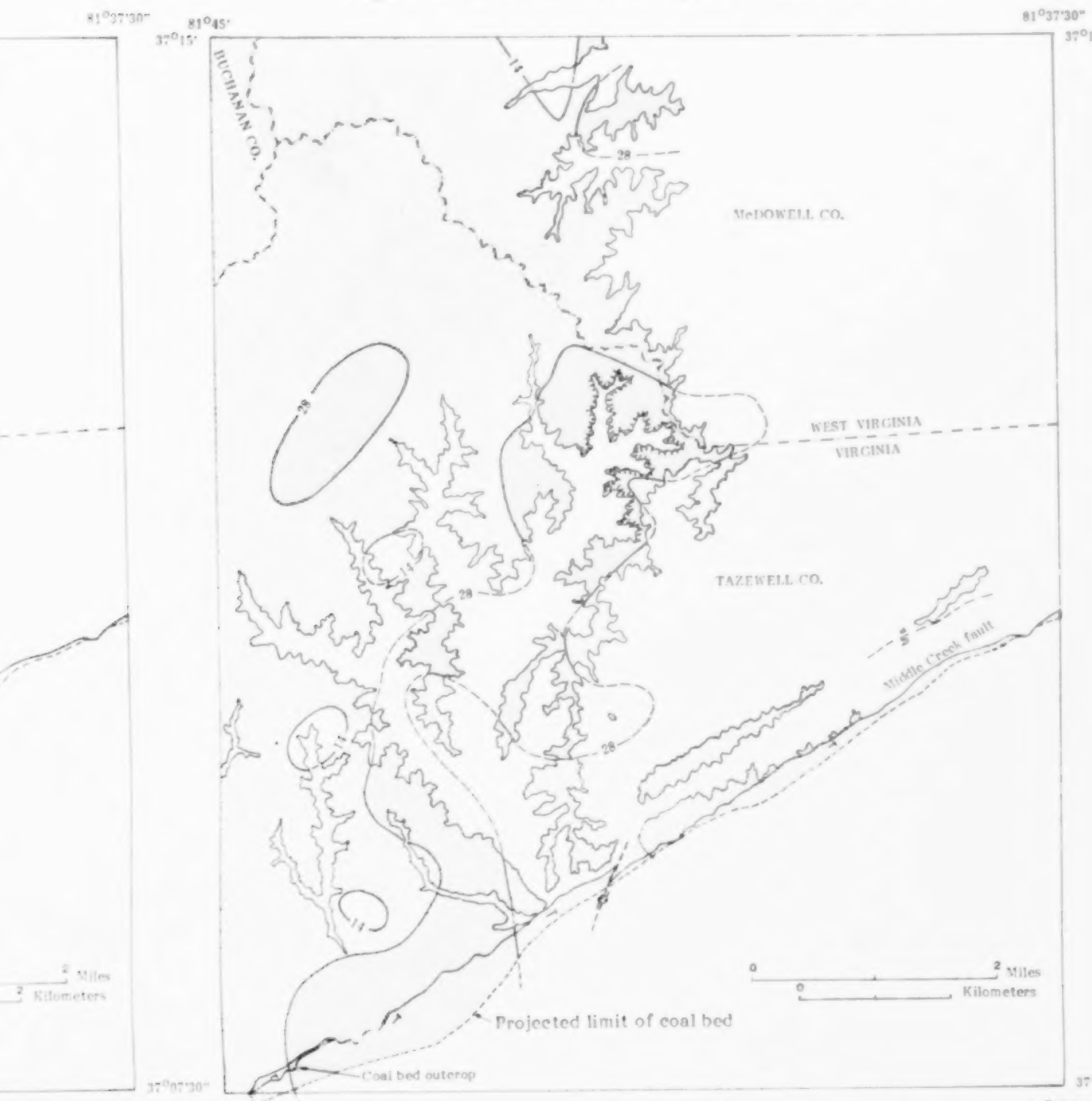


Figure 8.--Distribution of the Sewell(?) coal bed.

oal bed.

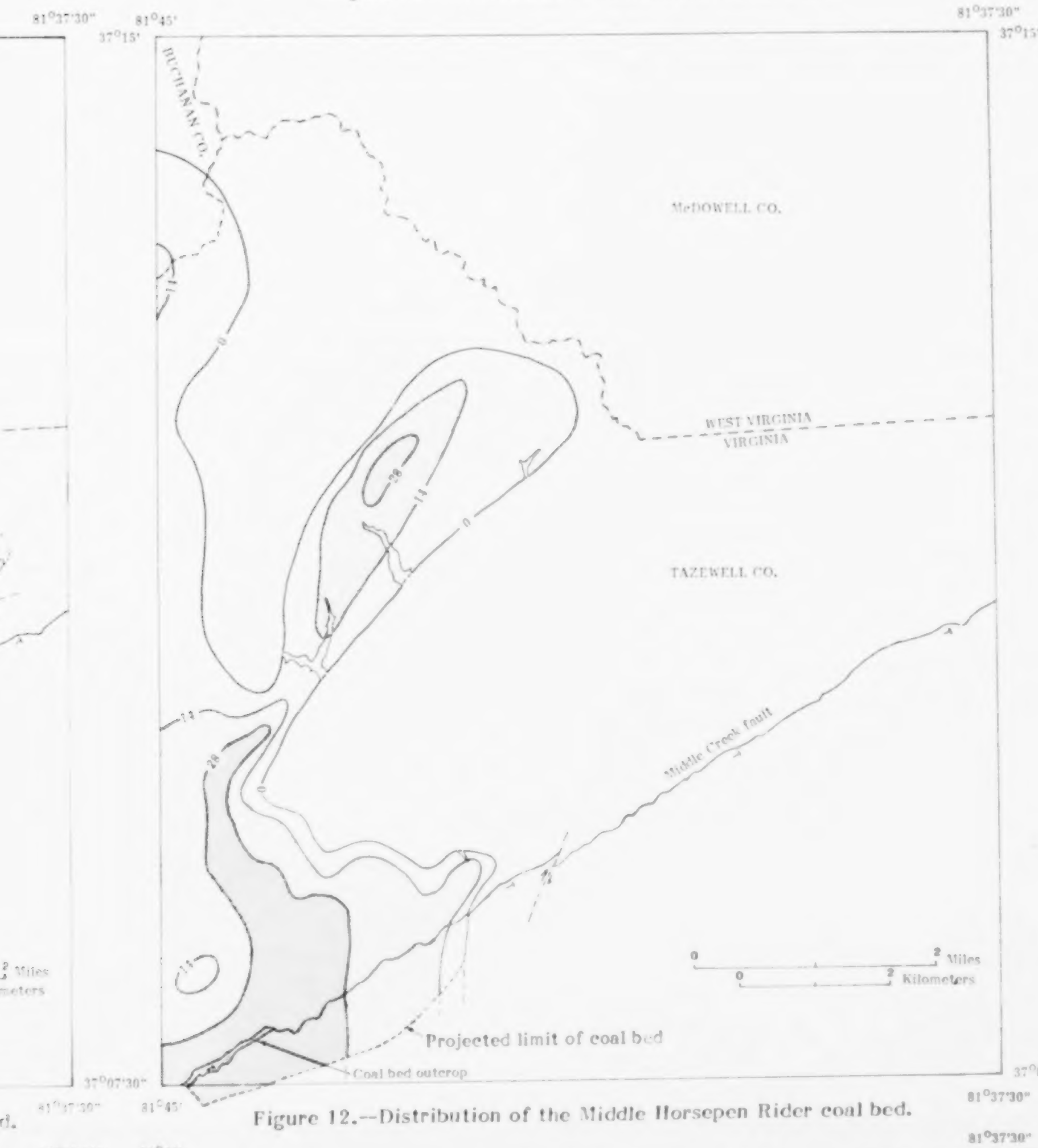


Figure 12.--Distribution of the Middle Horsepen Rider coal bed.

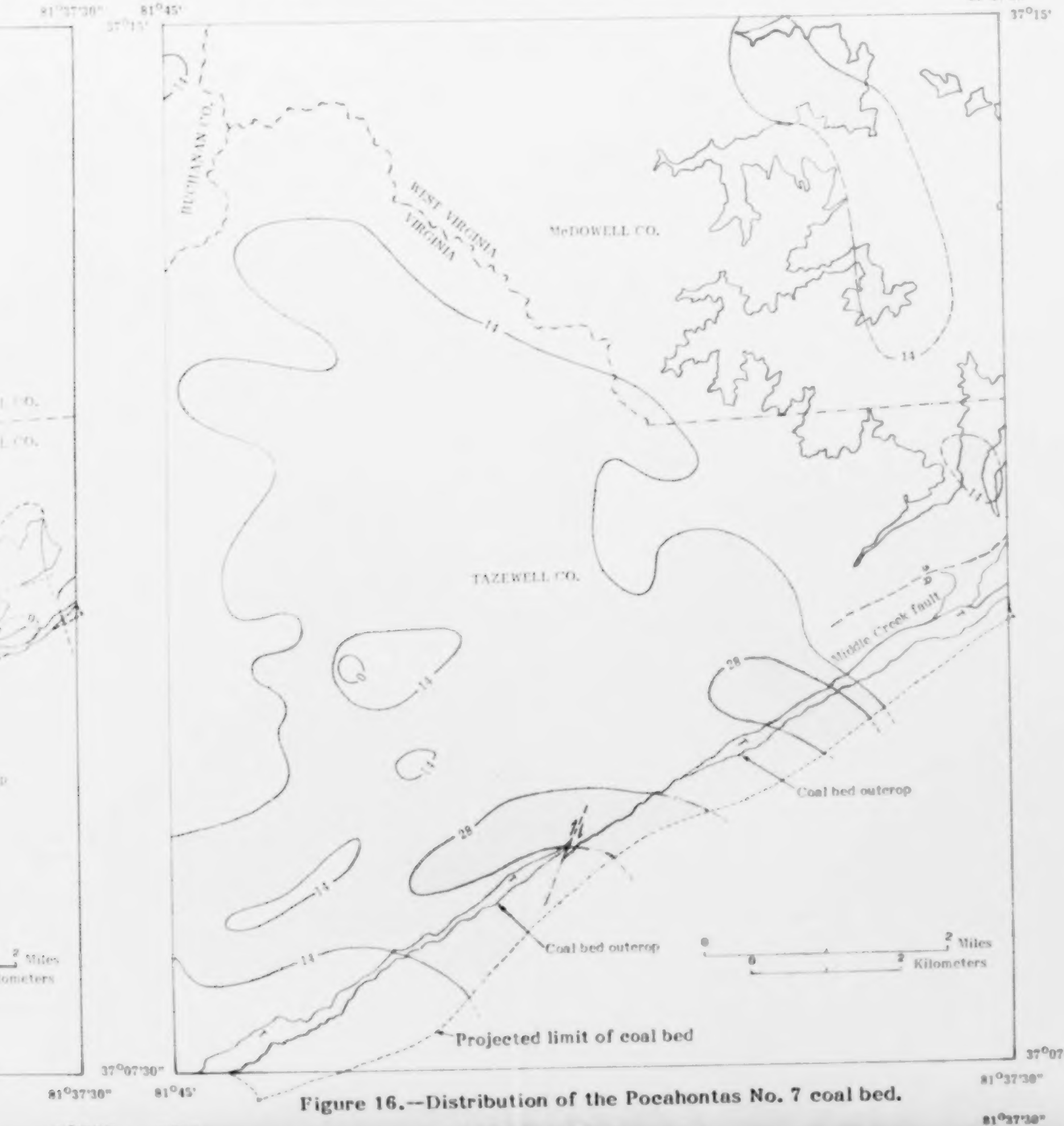


Figure 16.--Distribution of the Pocahontas No. 7 coal bed.

81°37'30" 81°45' 81°37'30"

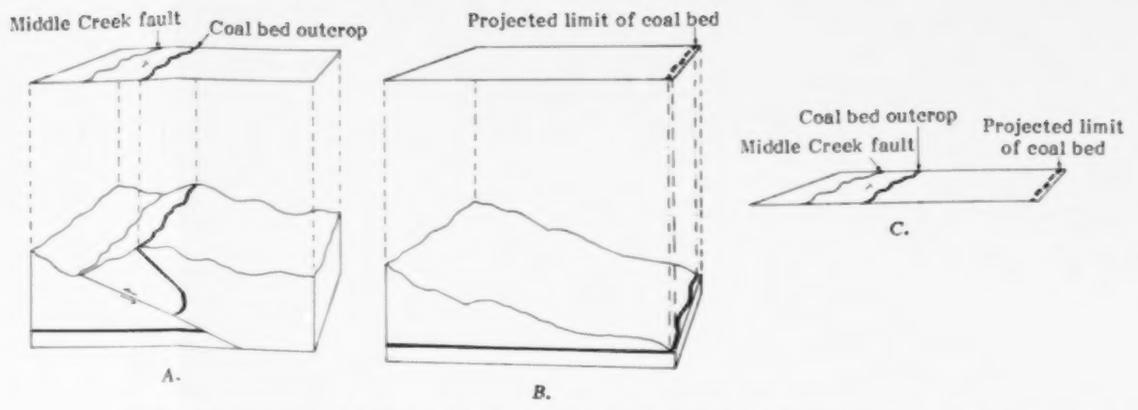


Figure 21.--Depiction of folded and faulted coal bed. *A*, folded and faulted coal bed. *B*, coal bed prior to folding and faulting. *C*, composite of map views of *A* and *B*; corresponds to outlined area on figure 20.

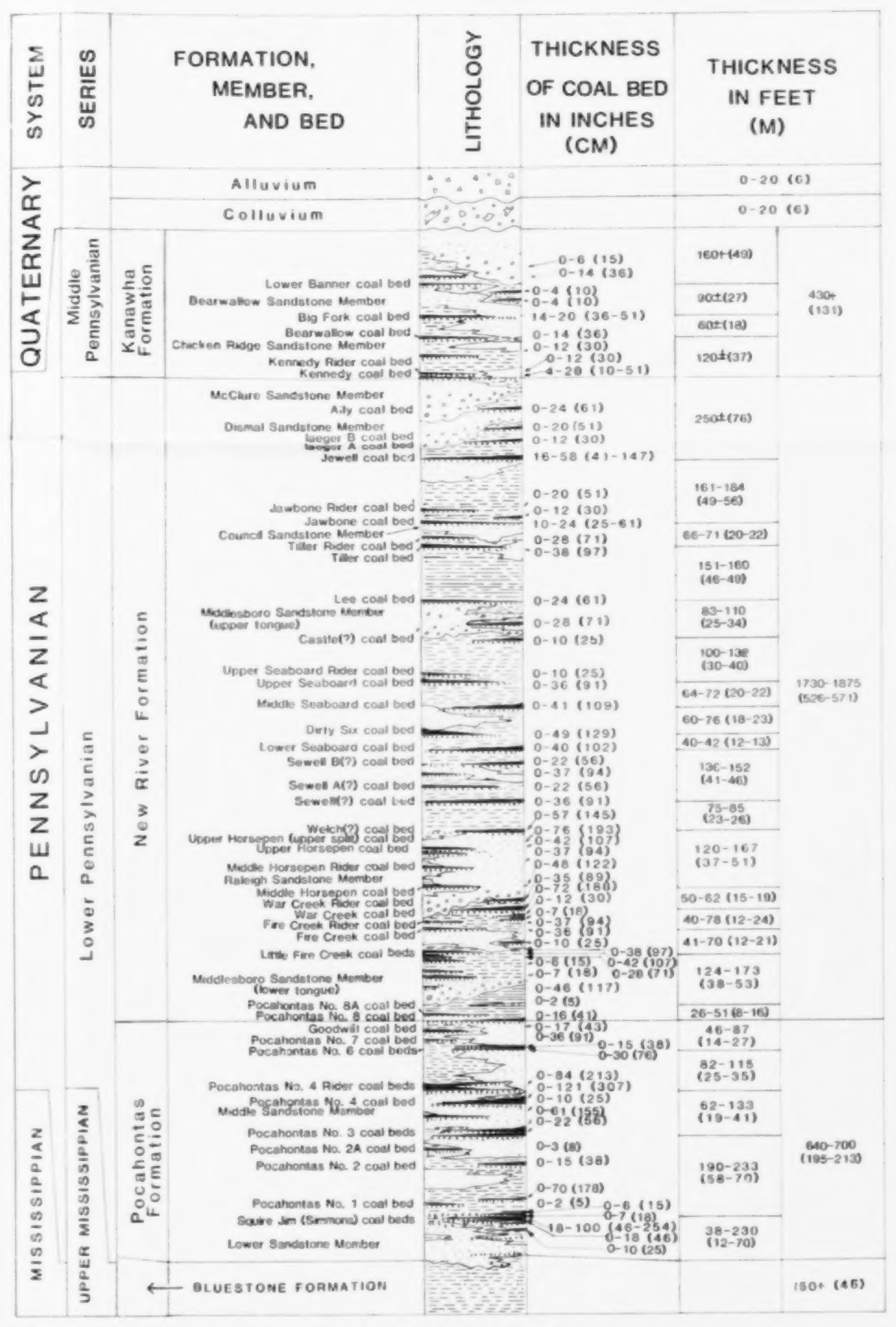


Figure 22.--Generalized stratigraphic column of coal-bearing formations.

Table 1.—*Estimated original and remaining coal resources in the Amonate, Va.-W.Va. quadrangle*
[In thousands of short tons, as of January 1981]

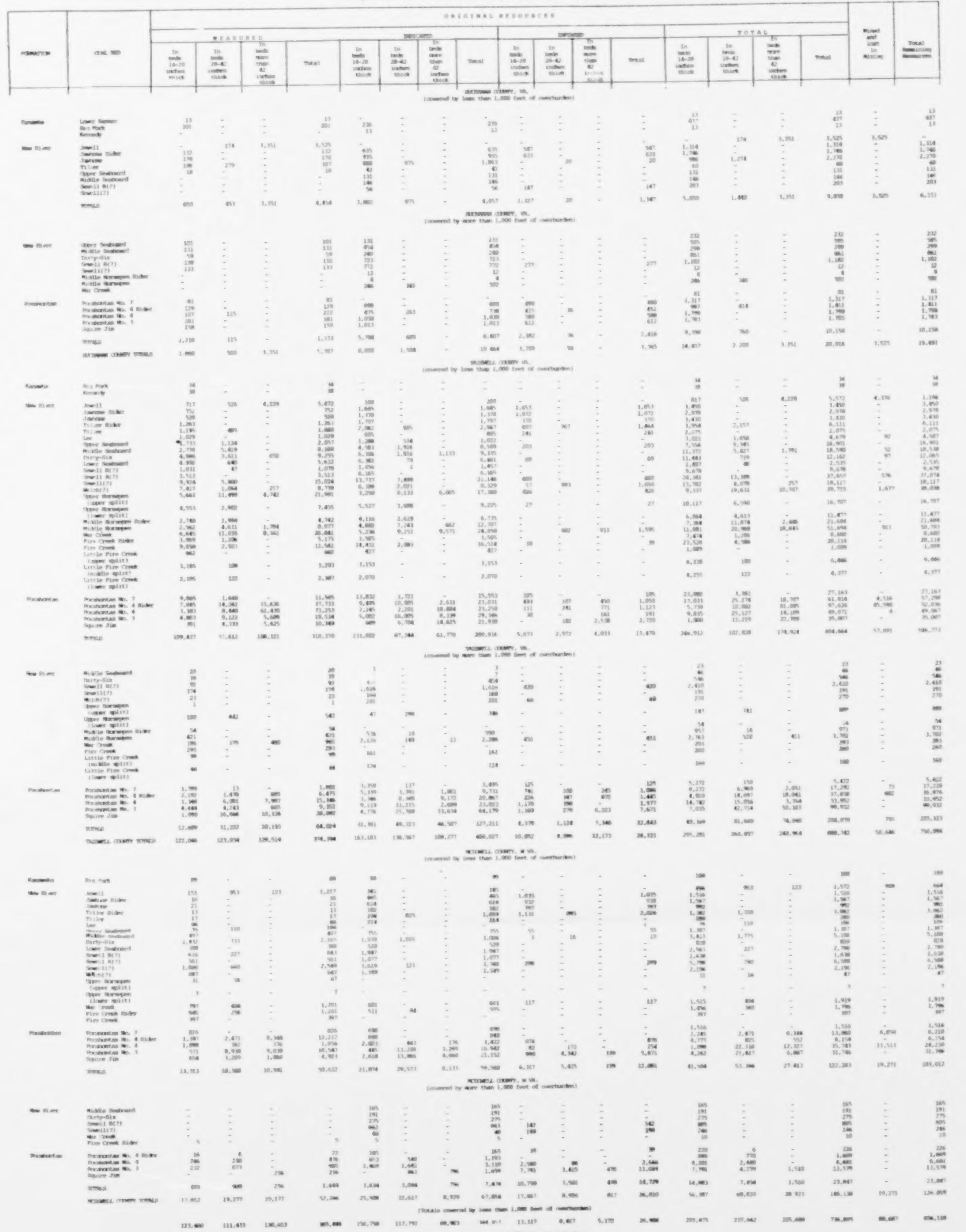
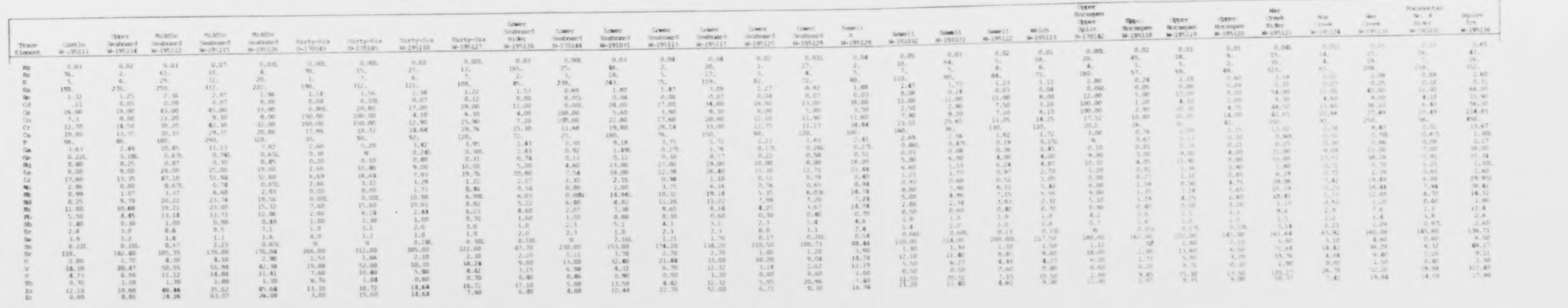


Table 2.—*Trace element composition of samples from the Amonate, Va.-W.Va. quadrangle*
[Values in parts per million. L after a value means less than value shown. N. means not detected. Analyses by U.S. Geological Survey.]



EXPLANATION

▩	Area underlain by estimated coal resources greater than 42 in. (105 cm) thick
▨	Area underlain by estimated coal resources 28–42 in. (70–105 cm) thick
▨	Area underlain by estimated coal resources 14–28 in. (35–70 cm) thick
☐	Area where coal is absent or less than 14 in. (35 cm) thick
▨	Mined area; dashed where approximate
	Outcrop of coal bed; dashed where approximately located; labeled south of the Middle Creek fault
	Projected limit of coal beds (south of Middle Creek fault) prior to folding and faulting; labeled on map
—28--	Coal thickness line; dashed where approximately located. Thickness is in inches; isopach interval is 14 in.
	Strip mine
---U/D-	Fault, inferred; U-upthrown, D-downthrown
	Thrust fault; T indicates upper plate
	Tear fault inferred; arrows show relative movement

MINERAL RESOURCES

Coal Geology

Coal is the principle mineral resource developed in the Amonate quadrangle. It is of low- to high-volatile, A-bituminous rank. Total estimated original resources in the quadrangle are 974 million short tons. Coal mined or lost in mining is estimated to be 81 million short tons, leaving approximately 893 million short tons of remaining resources. Table 1 shows the coal resource estimates for all coal beds in the quadrangle by state and county.

The thickest coal overlies lobate sandstone beds of distributary delta systems (Englund, 1974, p. 43) Several coal beds have been extensively developed by underground, surface, and auger methods. Most of the production has been from the Pocahontas No. 3, No. 4, No. 4 Rider, Upper Horsepen, Sewell, and Jewell coal beds. Figures 1-20 show the distribution of coal resources of the major beds in the quadrangle. These should not be interpreted as geologic maps because folded and faulted portions of the coal beds south of the Middle Creek fault on figures 5-20 are depicted as if they were flat lying for purposes of resource calculations (fig. 21).

Approximately 3,150 feet (960 m) of coal-bearing rocks crop out in the quadrangle. These include the entire Pocahontas and New River Formations of Early Pennsylvanian age and the lower portion of the Kanawha Formation of Middle Pennsylvanian age. Figure 22 shows stratigraphic relations and thicknesses of the formations, coal beds, and intervening lithologies. Coal lithotypes are predominately thin- to thick-banded vitrinite, bright to dull attritus (mixed lithologies) containing minor fusinite bands, and sparsely disseminated pyrite and calcite. The Squire Jim and Dirty-Six coal beds contain numerous shale and underclay partings. Pocahontas coal is mostly fine cleated, whereas New River and Kanawha coals are medium to coarsely cleated. The coal field south of the Middle Creek fault has been deformed tectonically and a narrow belt of coal-bearing rocks is overturned, faulted, or asymmetrically folded. Coal beds in this belt have been sheared and crushed.

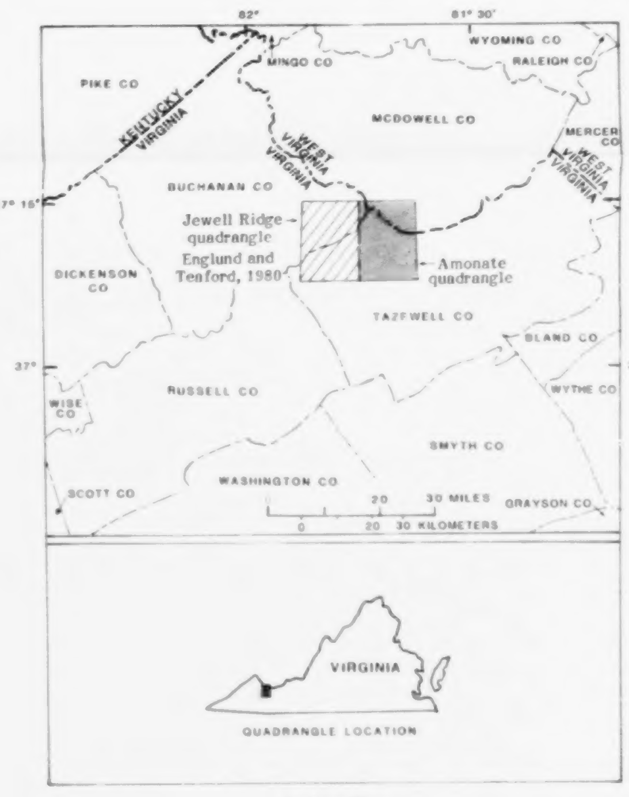
Thirty coal samples from 15 different beds were analyzed for trace elements (table 2) and major and minor oxide composition (table 3). Proximate and ultimate analyses for eight coal samples from five different beds are listed in table 4. The Middle Seaboard, War Creek Rider, and Squire Jim coal samples are high in trace element concentration and ash composition due to the inclusion of partings. The heating value for the Squire Jim coal, in parenthesis, was calculated as moisture and ash free. Most of the coal in the quadrangle is of high quality and is suitable for coke manufacture. Analyses of the samples, on an as-received basis, show that most of the coal is low to moderately high in ash (less than 9 percent), low to moderate in sulfur (less than 1 percent), and high in heating value (greater than 14,000 Btu/pound). No significant amounts of potentially toxic or economically valuable trace elements were found in the samples. Coal resources were calculated according to U.S. Geological Survey Bulletin 1450-B (1976). Analytical data are available from the National Coal Resource Data System (NCRDS).

Other Mineral Occurrences

Minor barite mineralization with accessory pyrite is disseminated in the upper part of the Shady Dolomite in the southeastern part of the quadrangle (Windolph, 1983).

REFERENCES

Englund, K. J., 1974, Sandstone distribution patterns in the Pocahontas Formation of southwest Virginia and southern West Virginia, Briggs, Garnett, ed., Carboniferous of the southeastern United States: Geological Society of America Special Paper 148, p. 31-45.
Englund, K. J., and Teaford, N. K., 1980, Maps showing coal resources of the Jewell Ridge quadrangle, Buchanan and Tazewell Counties, Virginia: U.S. Geological Survey Miscellaneous Field Studies Map MF-1211.
Englund, K. J., 1981, Geologic map of the Jewell Ridge quadrangle, Buchanan and Tazewell Counties, Virginia: U.S. Geological Survey Geologic Quadrangle Map GQ-1550, scale 1:24,000.
U.S. Geological Survey, 1976, Coal resource classification system of the U.S. Bureau of Mines and U.S. Geological Survey: U.S. Geological Survey Bulletin 1450-B, 7 p.
Windolph, J.F., Jr., 1983, Geologic map of the Amonate quadrangle, Virginia-West Virginia: U.S. Geological Survey Open-File Report 83-446, scale 1:24,000.



Index Map

Table 3.—*Major and minor oxide composition of the laboratory ash of coal samples from the Amonate, Va.-W.Va. quadrangle*
[Values in percent. L after a value means less than shown. Analyzed by U.S. Geological Survey.]

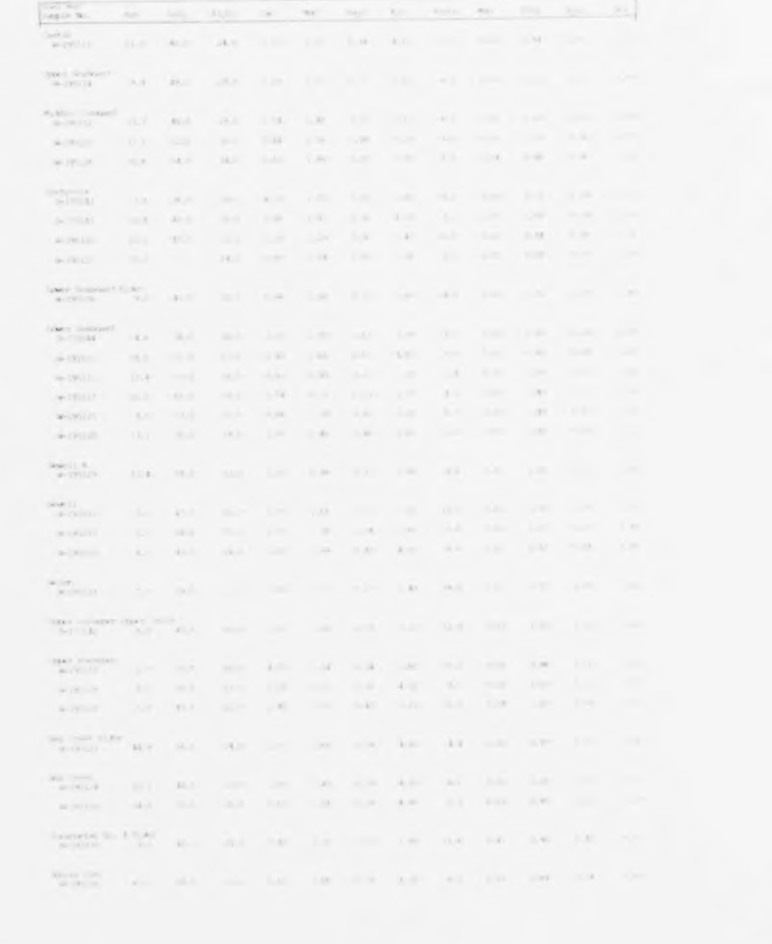
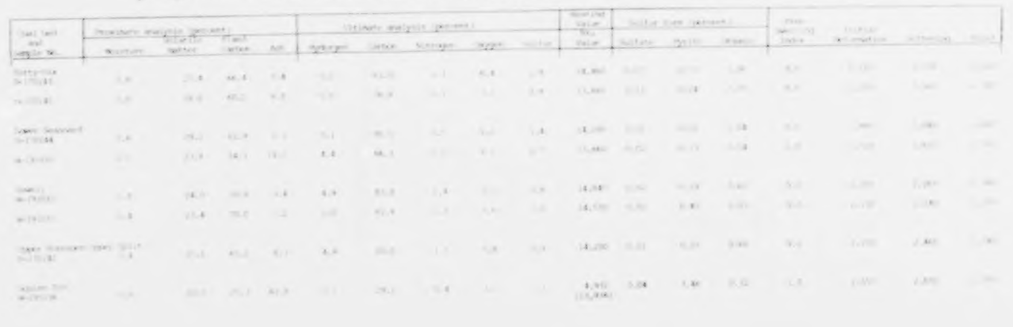


Table 4.—*Proximate and ultimate analyses of samples from the Amonate, Va.-W.Va. quadrangle*
[Analyses are on as-received basis. Channel samples by U.S. Geological Survey. Analyses by U.S. Bureau of Mines.]



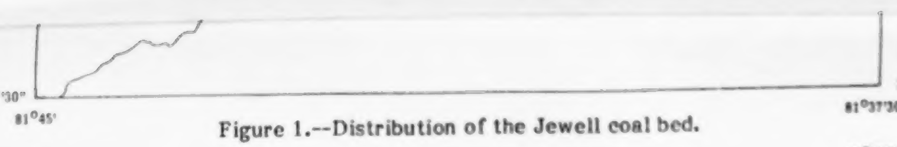


Figure 1.--Distribution of the Jewell coal bed.

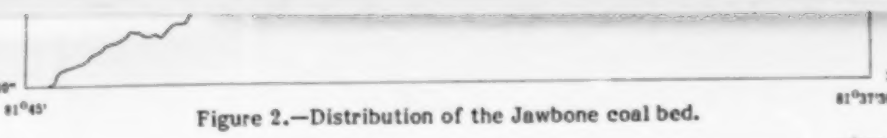


Figure 2.--Distribution of the Jawbone coal bed.

Figure 3.--Distribution of the Tiller coal bed.

Figure 4.--Distribution of the Upper Seaboard coal bed.

PENNSYLVANIAN

MISSISSIPPIAN

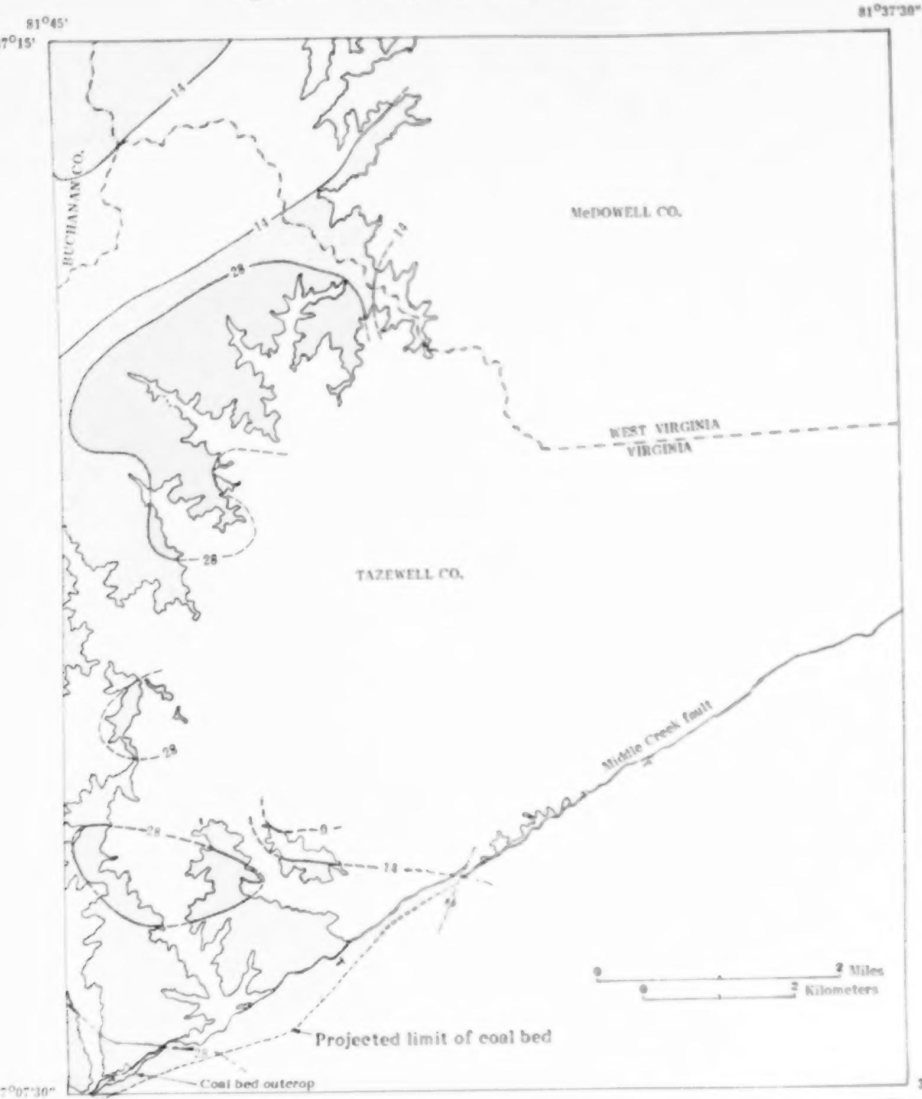


Figure 5.--Distribution of the Middle Seaboard coal bed.

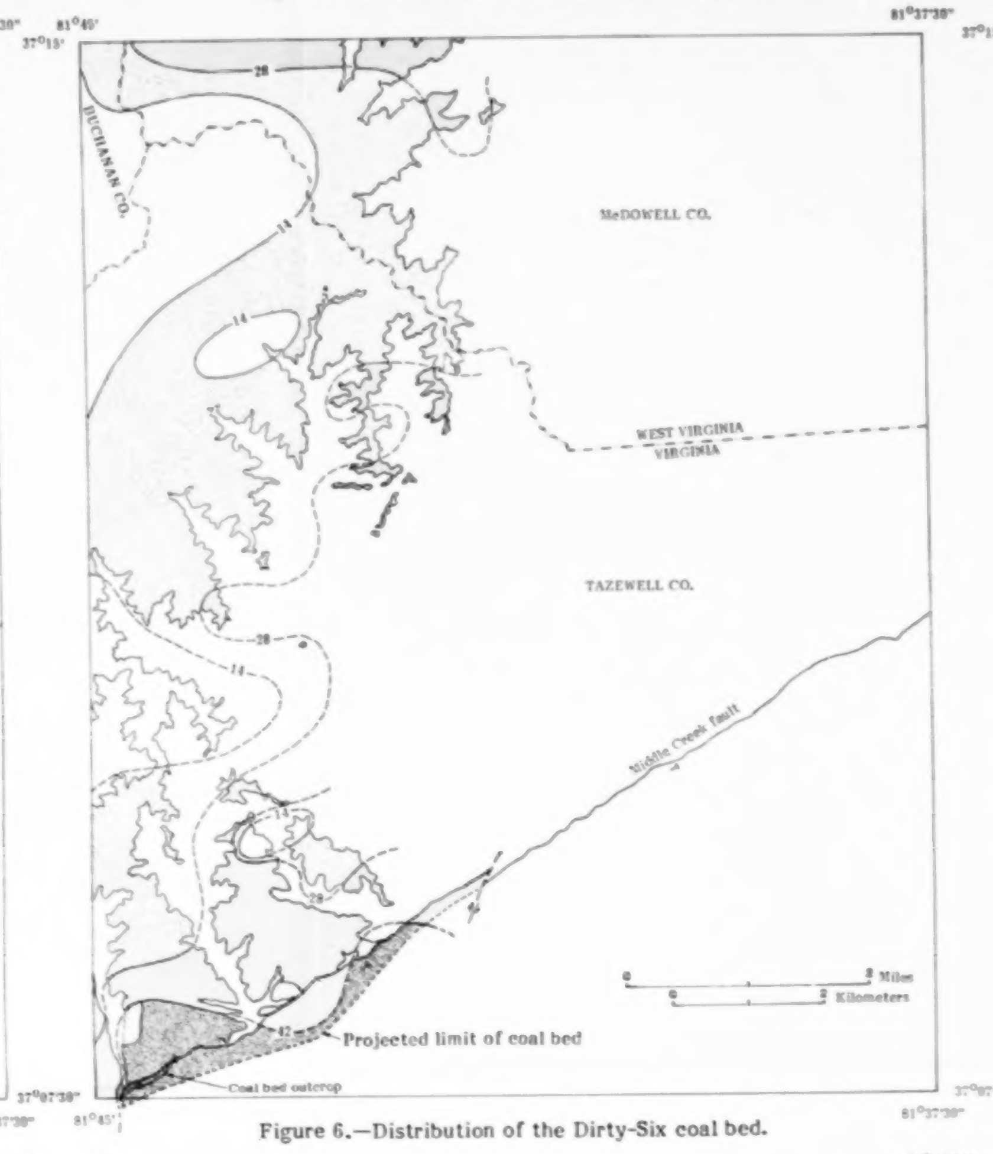


Figure 6.--Distribution of the Dirty-Six coal bed.

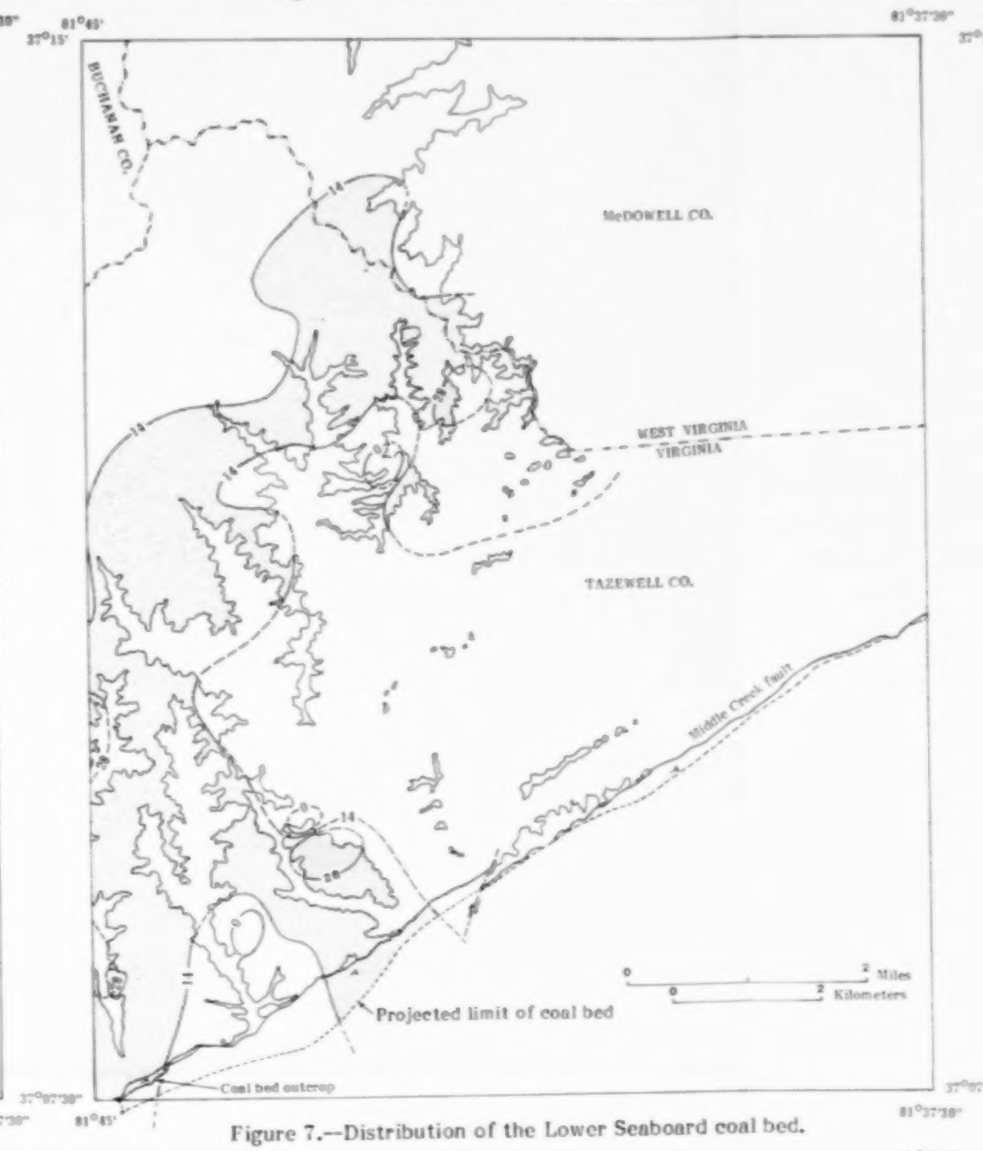


Figure 7.--Distribution of the Lower Seaboard coal bed.

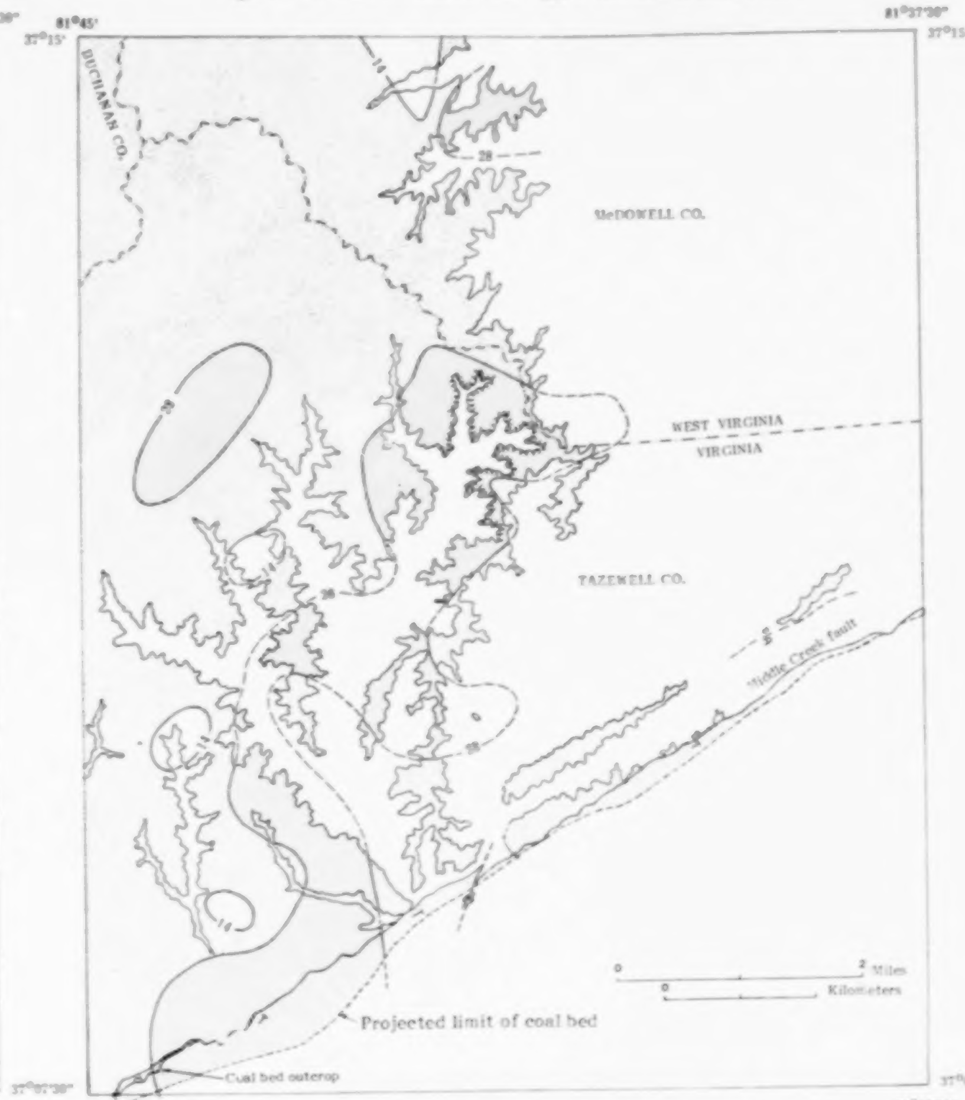


Figure 8.--Distribution of the Sewell(?) coal bed.

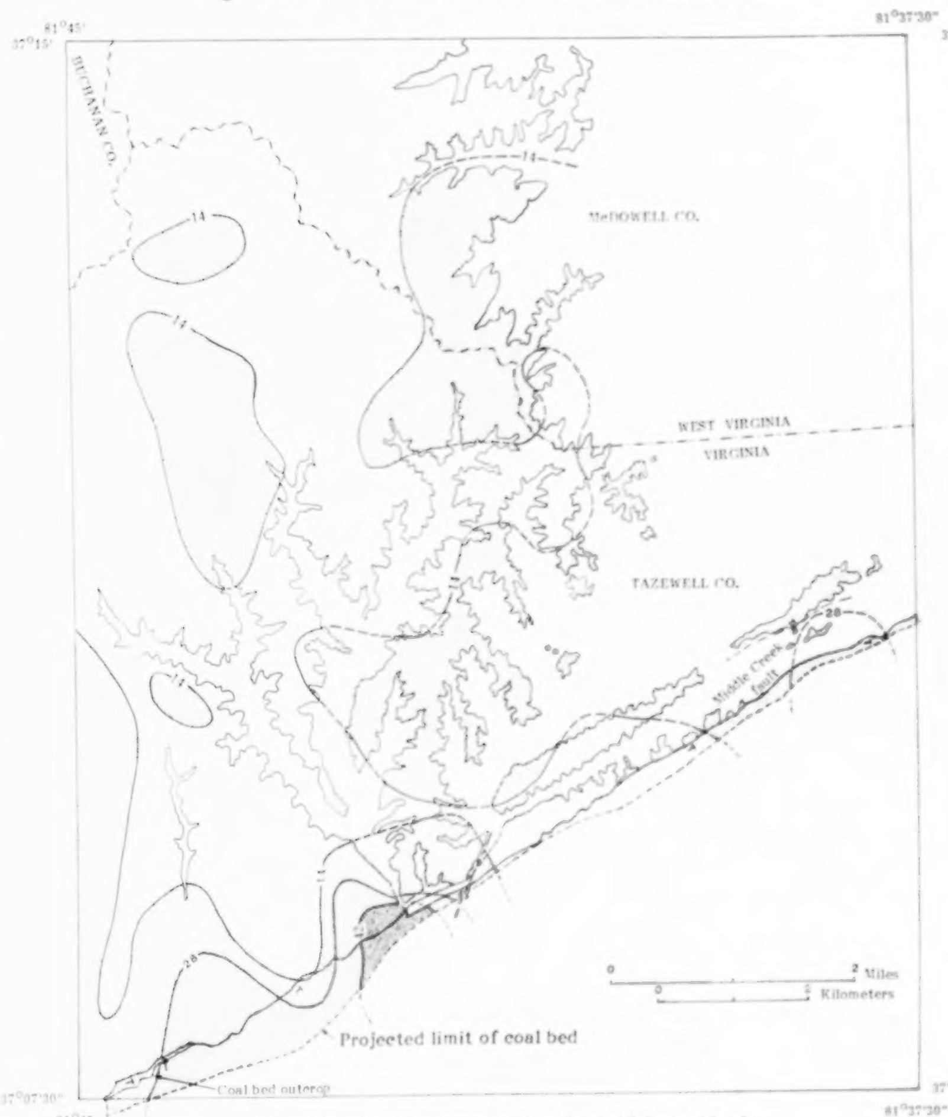


Figure 9.--Distribution of the Welch(?) coal bed.

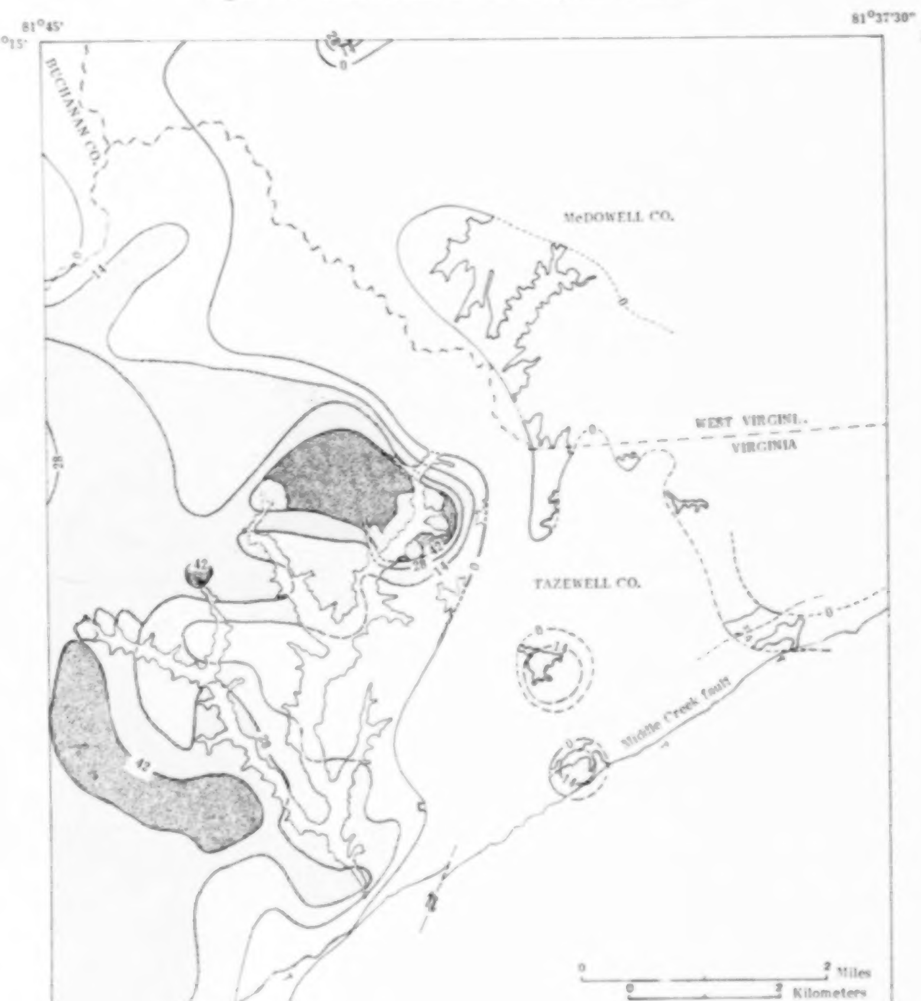


Figure 10.--Distribution of the Upper Horsepen (Upper Split) coal bed.

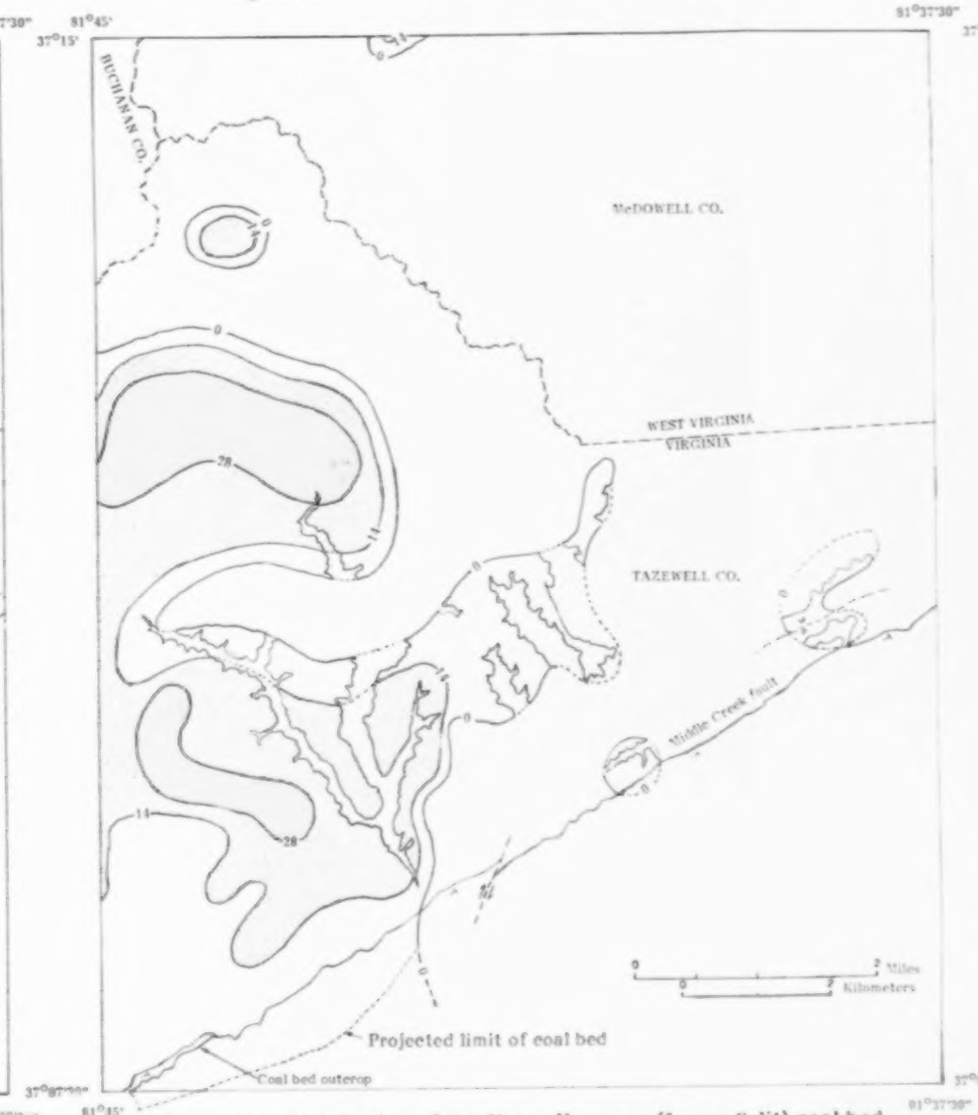


Figure 11.--Distribution of the Upper Horsepen (Lower Split) coal bed.

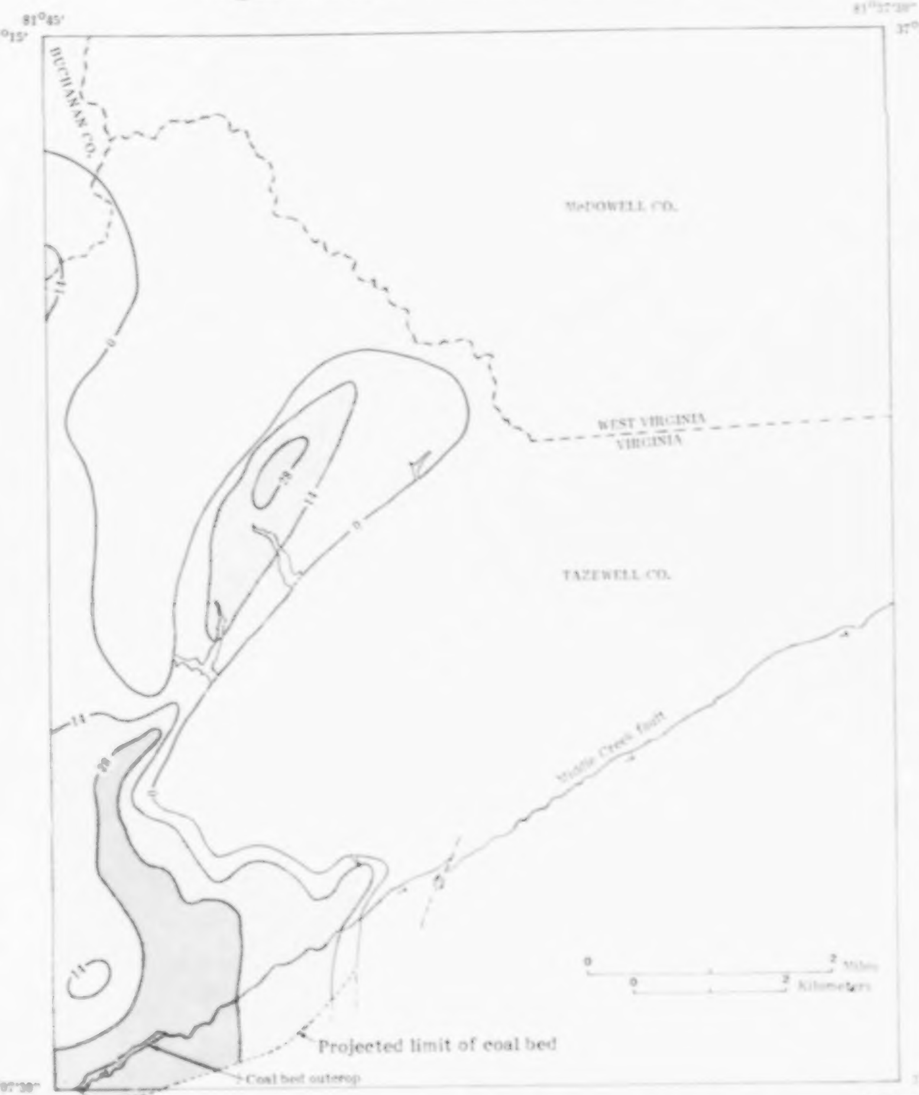


Figure 12.--Distribution of the Middle Horsepen Rider coal bed.

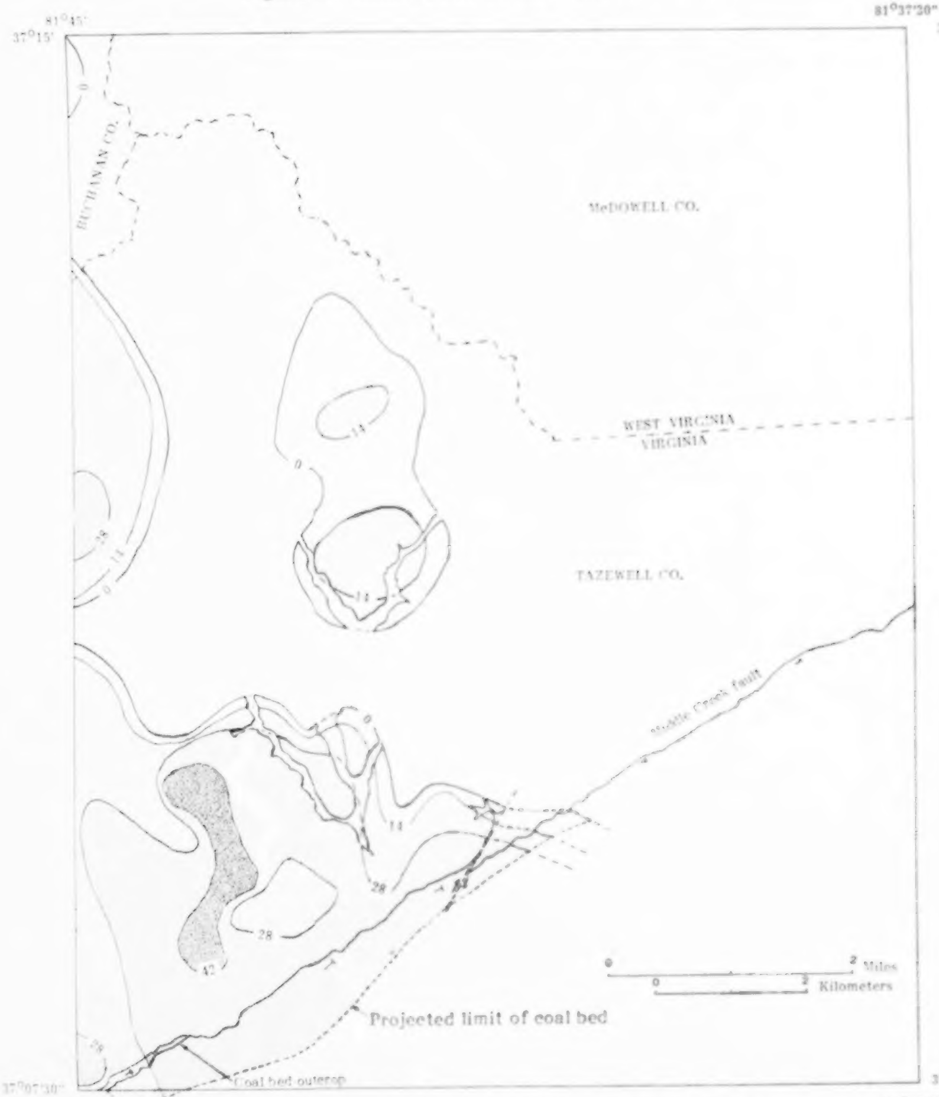


Figure 13.--Distribution of the Middle Horsepen coal bed.

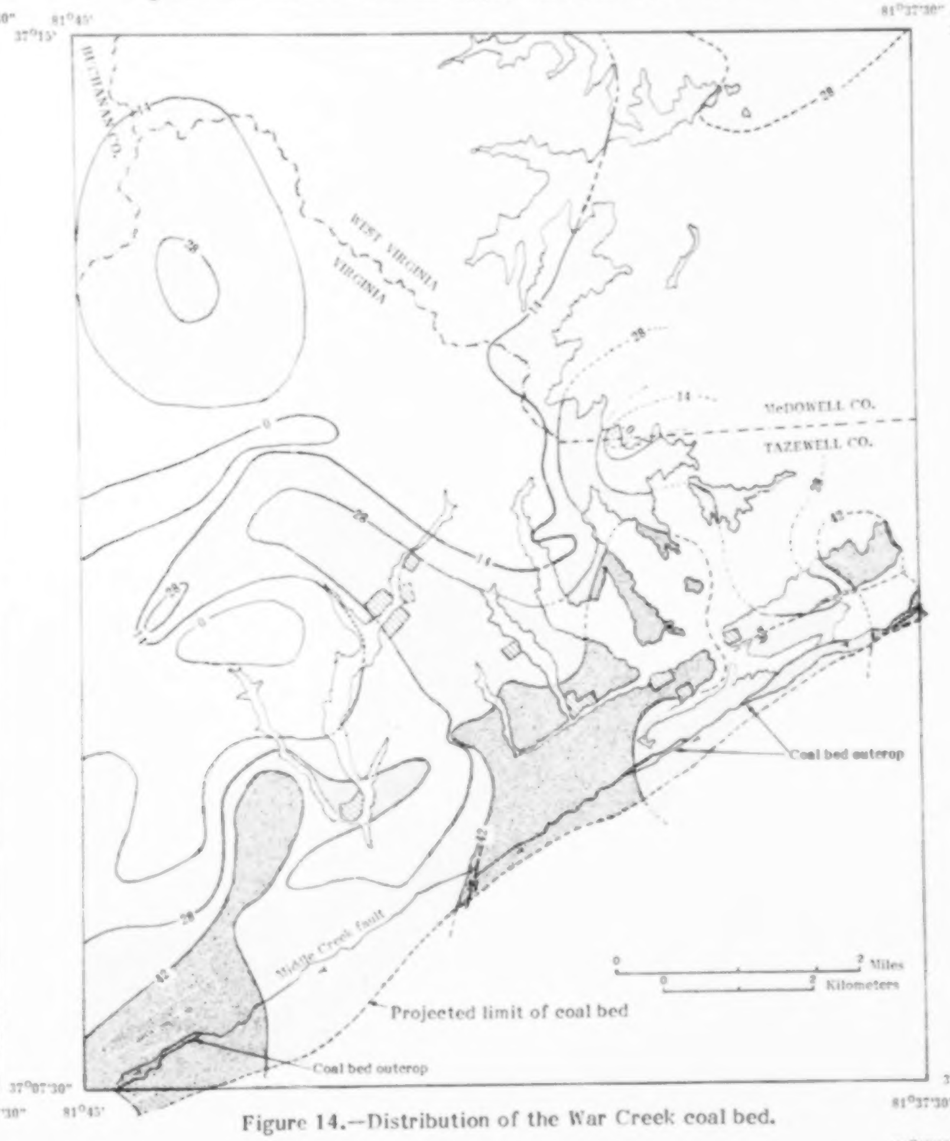


Figure 14.--Distribution of the War Creek coal bed.

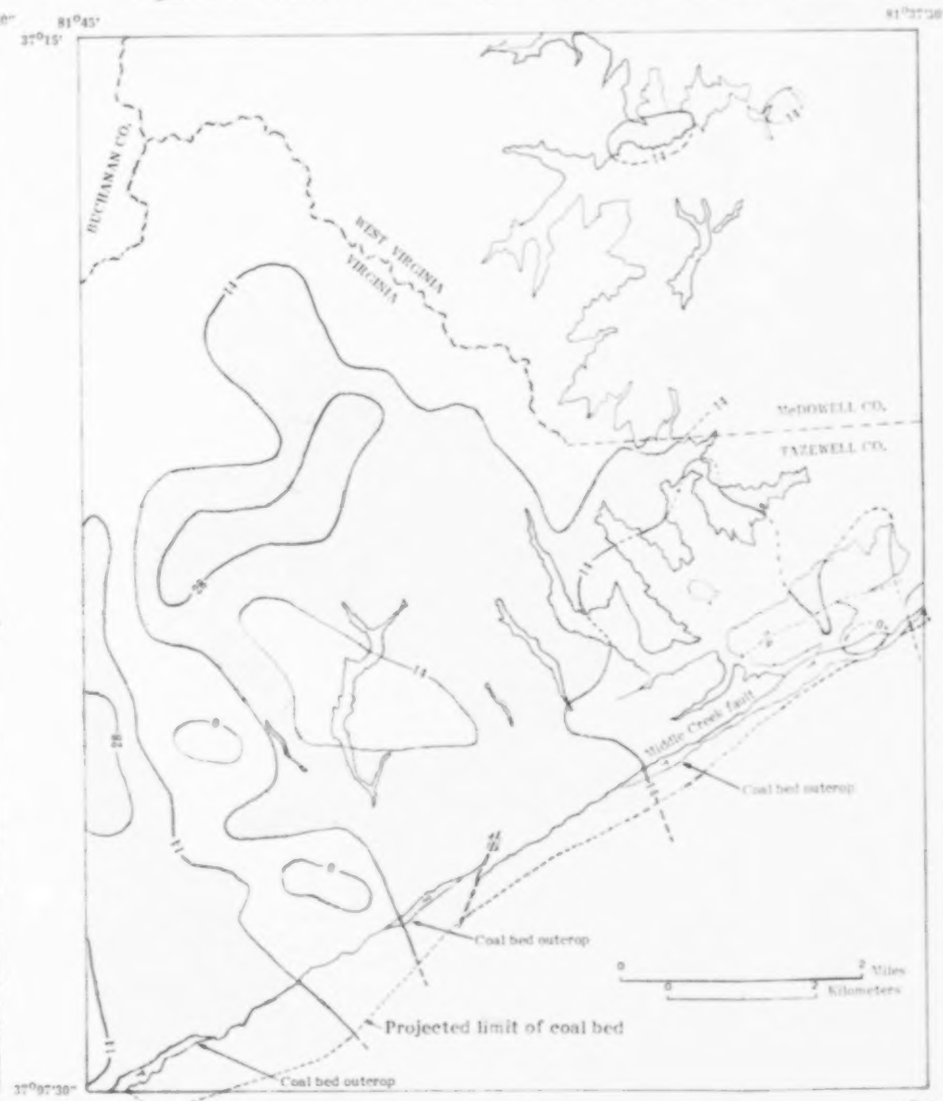


Figure 15.--Distribution of the Fire Creek coal bed.

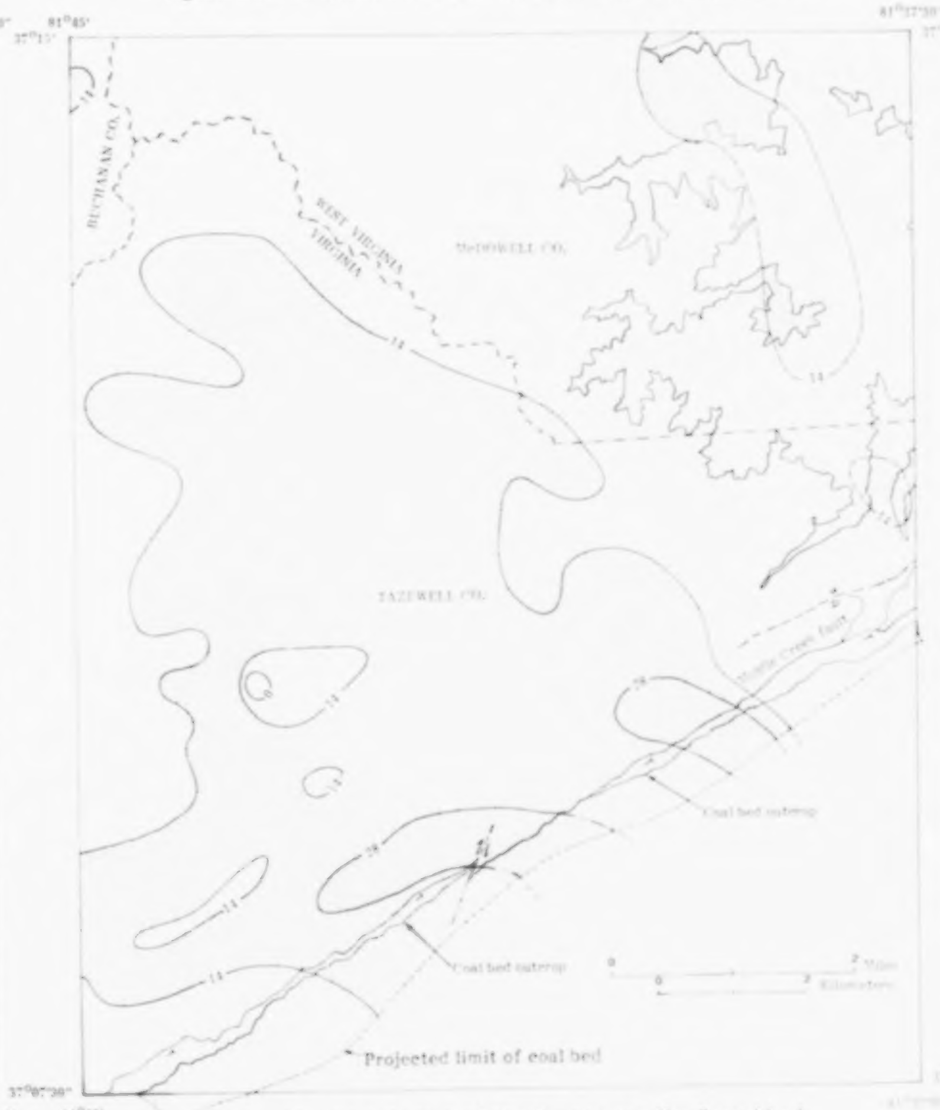


Figure 16.--Distribution of the Pocahontas No. 7 coal bed.

B

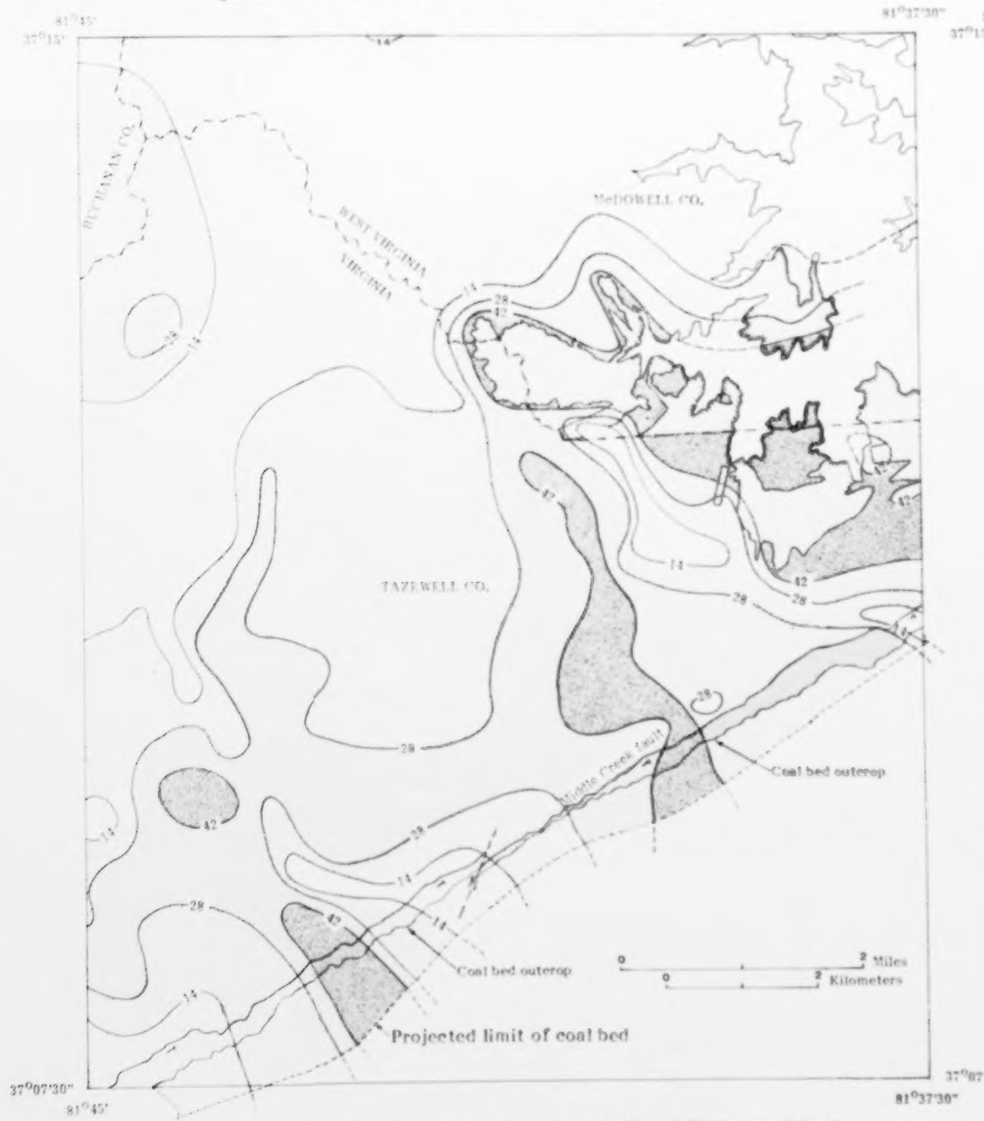


Figure 17.--Distribution of the Pocahontas No. 4 Rider coal bed.

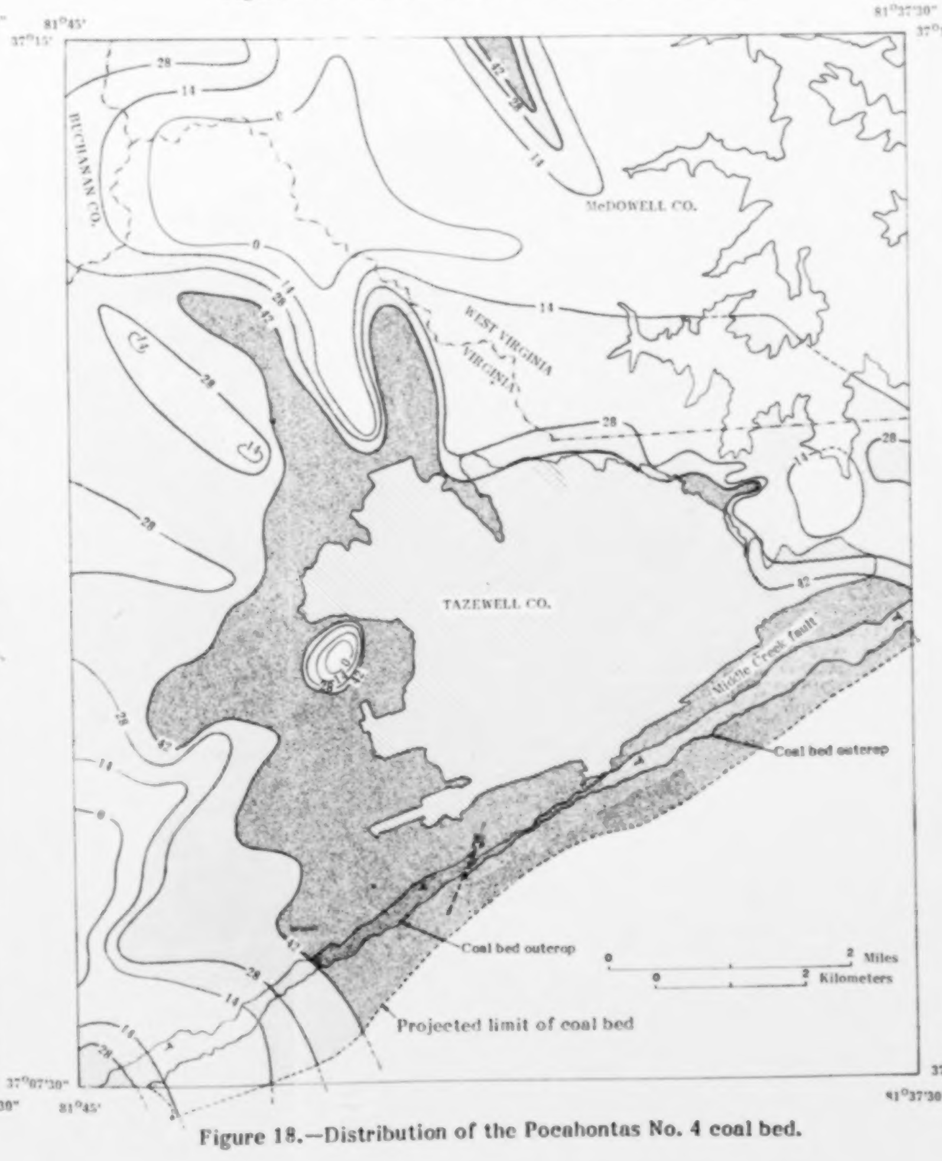


Figure 18.--Distribution of the Pocahontas No. 4 coal bed.

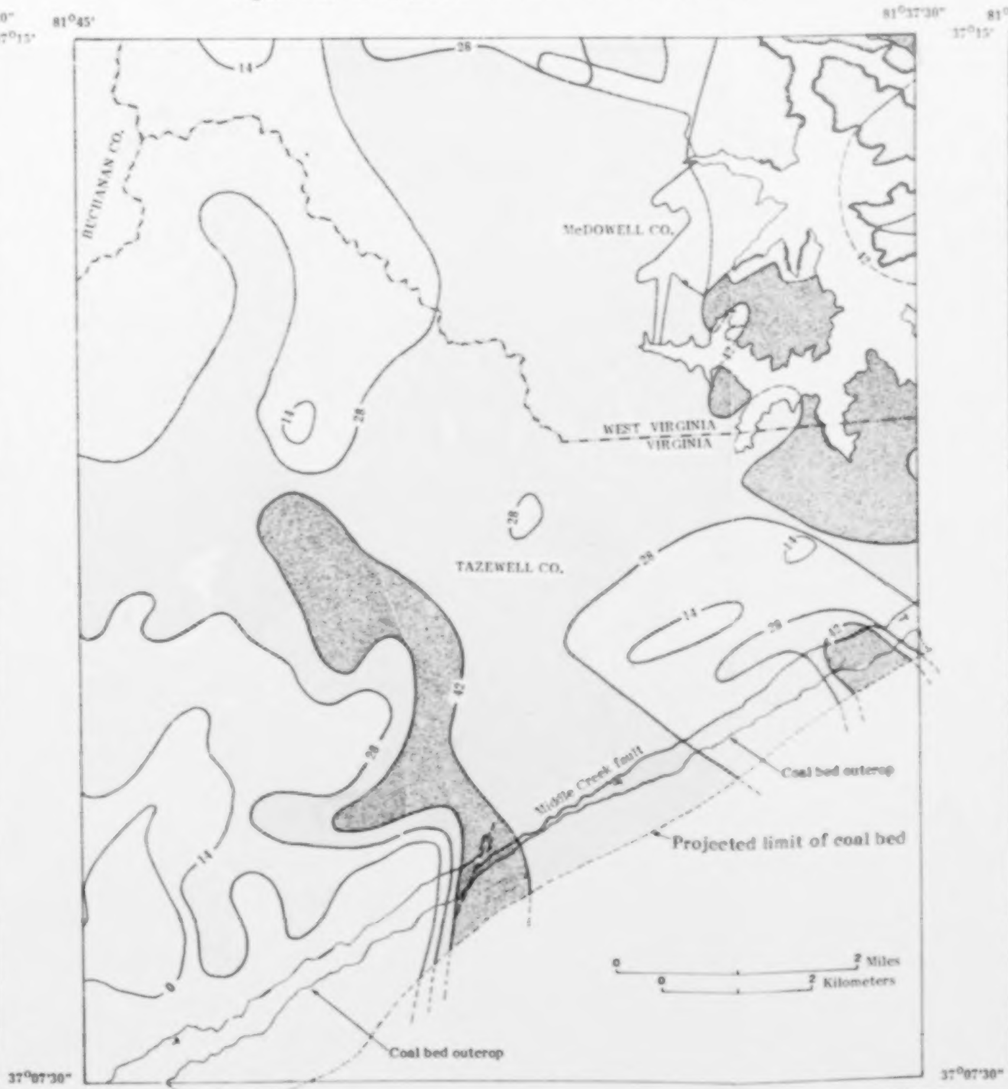


Figure 19.--Distribution of the Pocahontas No. 3 coal bed.

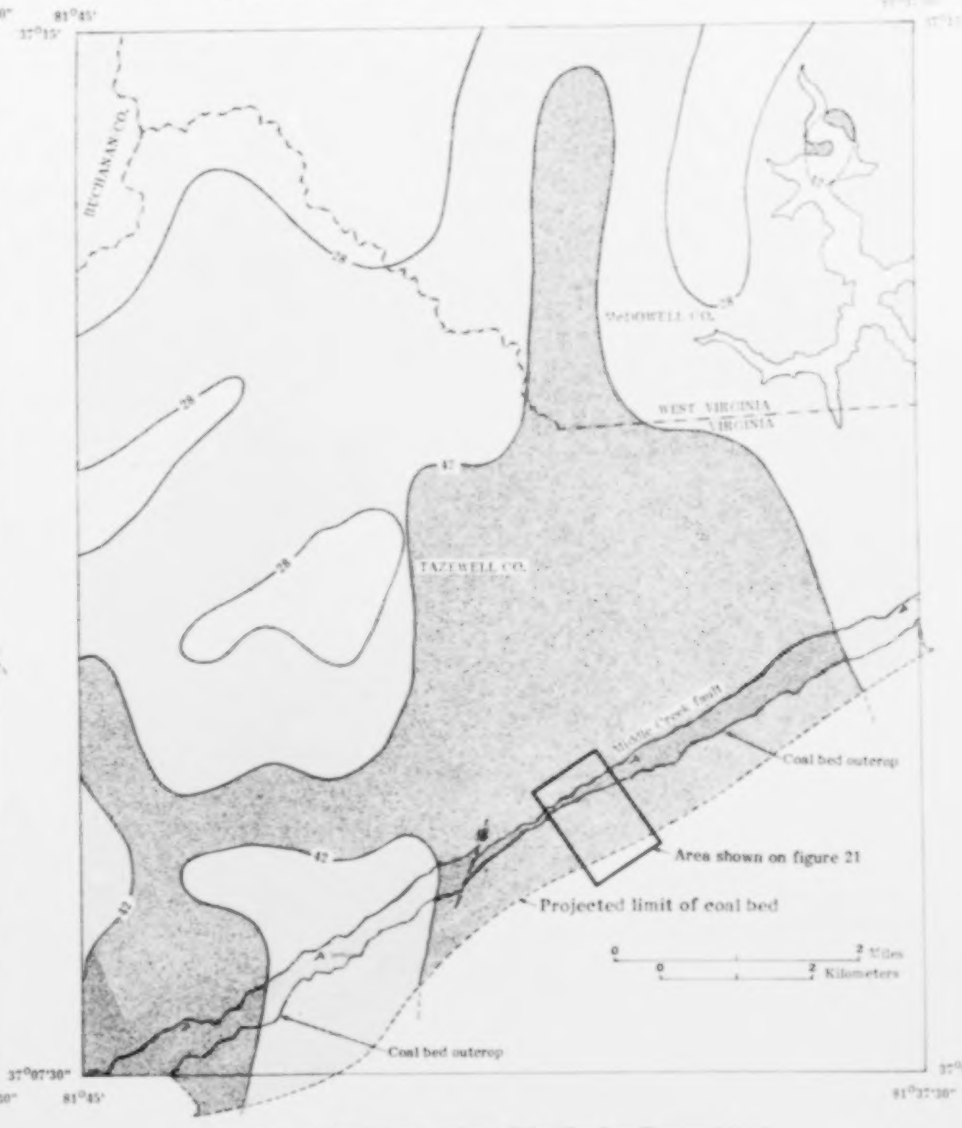


Figure 20.--Distribution of the Squire Jim coal bed.

best copy available

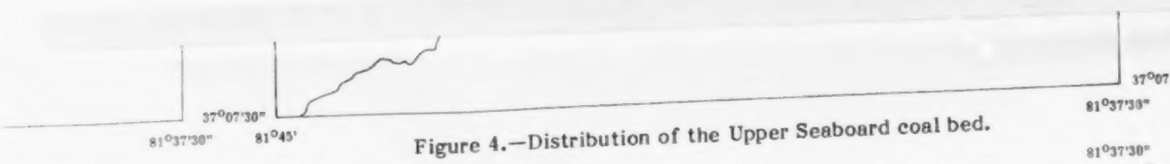


Figure 4.--Distribution of the Upper Seaboard coal bed.

l bed.

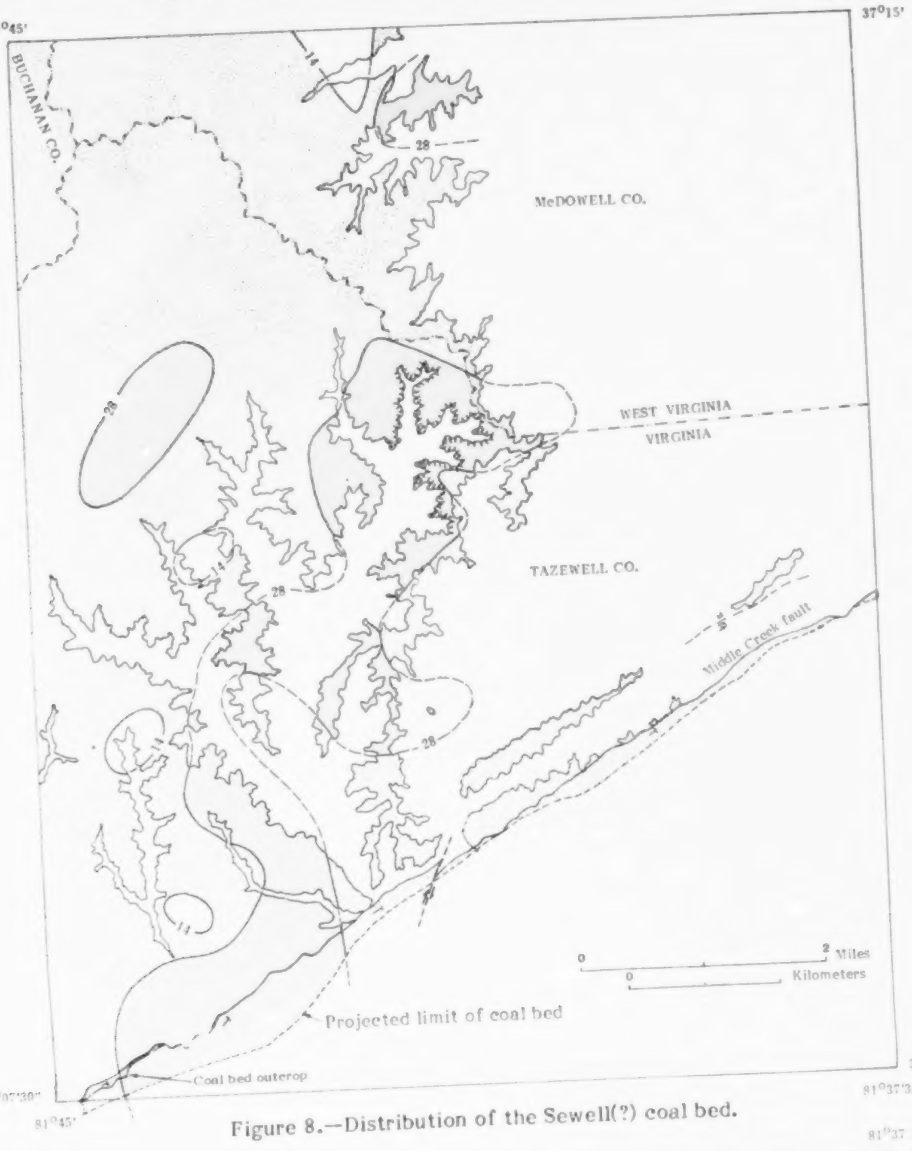


Figure 8.--Distribution of the Sewell(?) coal bed.

lit) coal bed.

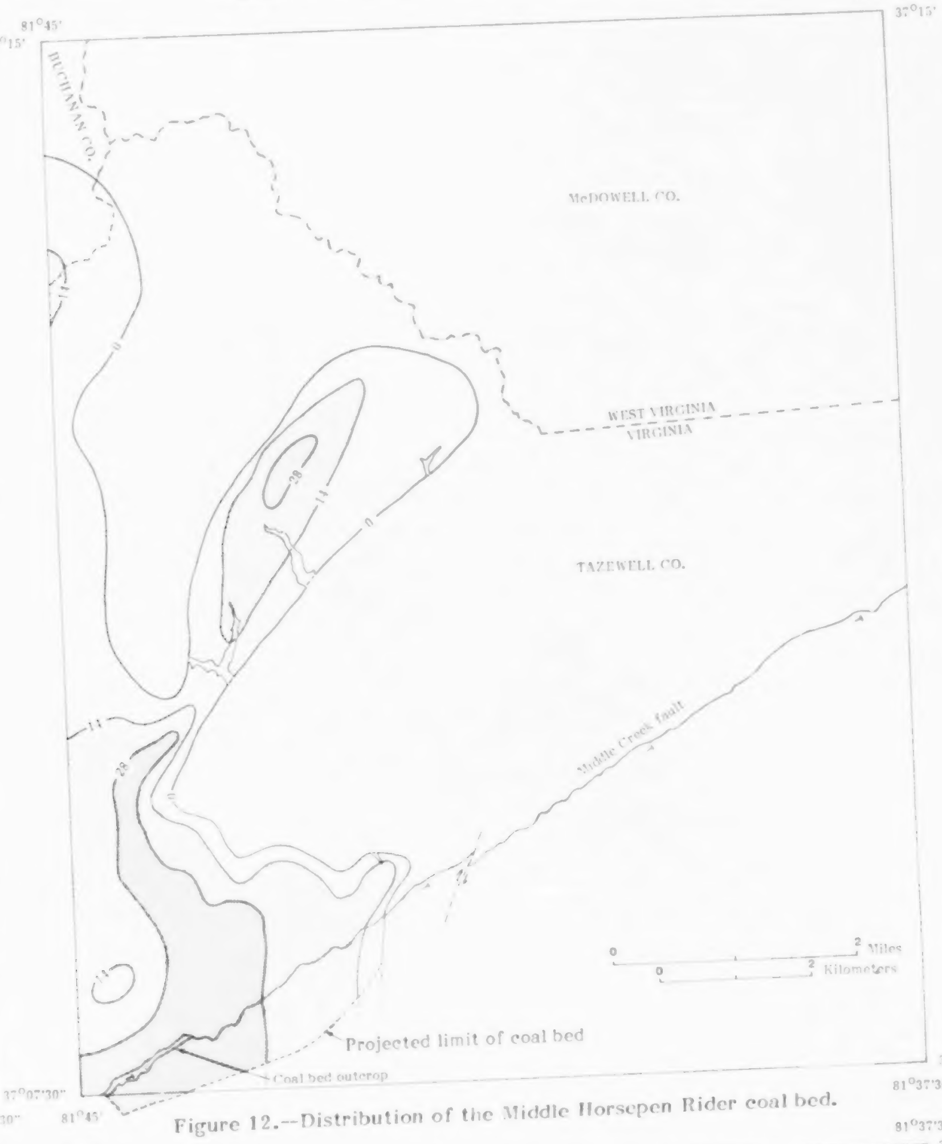


Figure 12.--Distribution of the Middle Horsepen Rider coal bed.

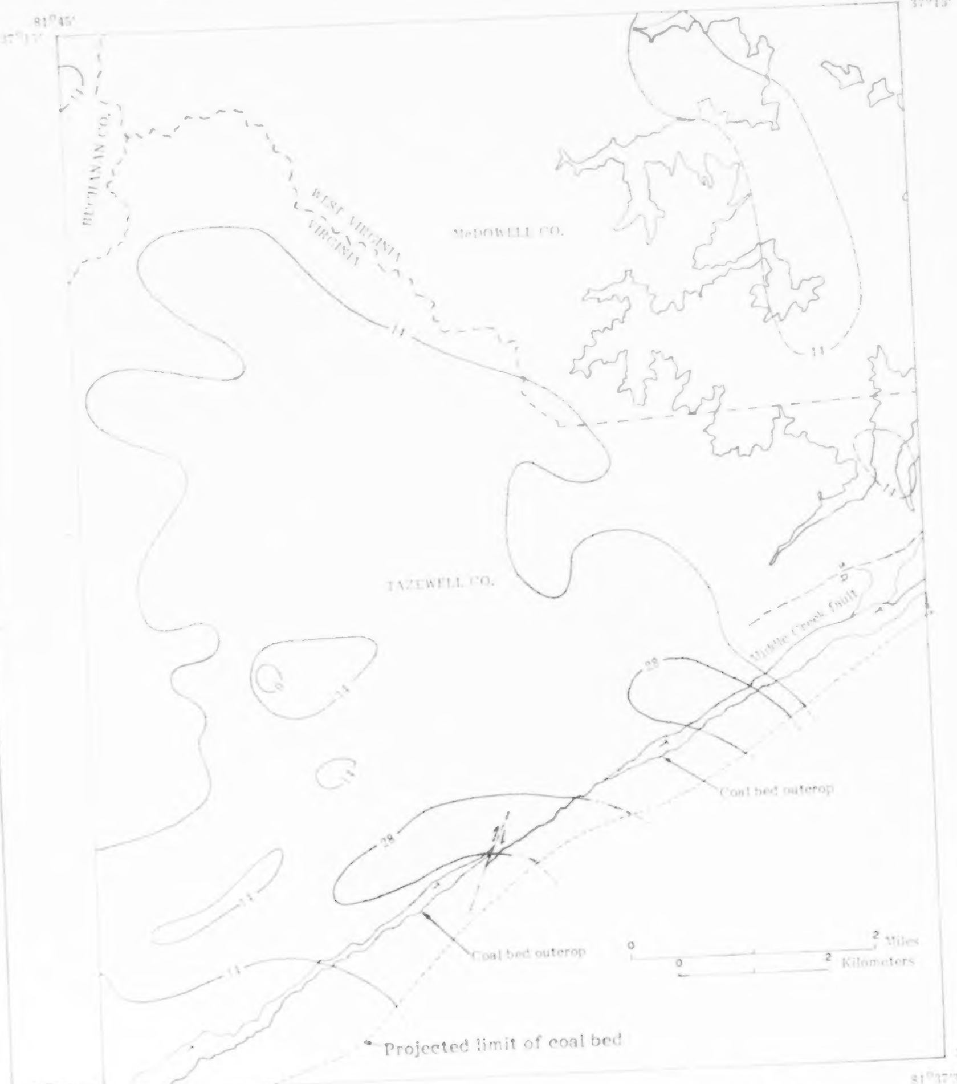


Figure 16.--Distribution of the Pocahontas No. 7 coal bed.

oal bed.

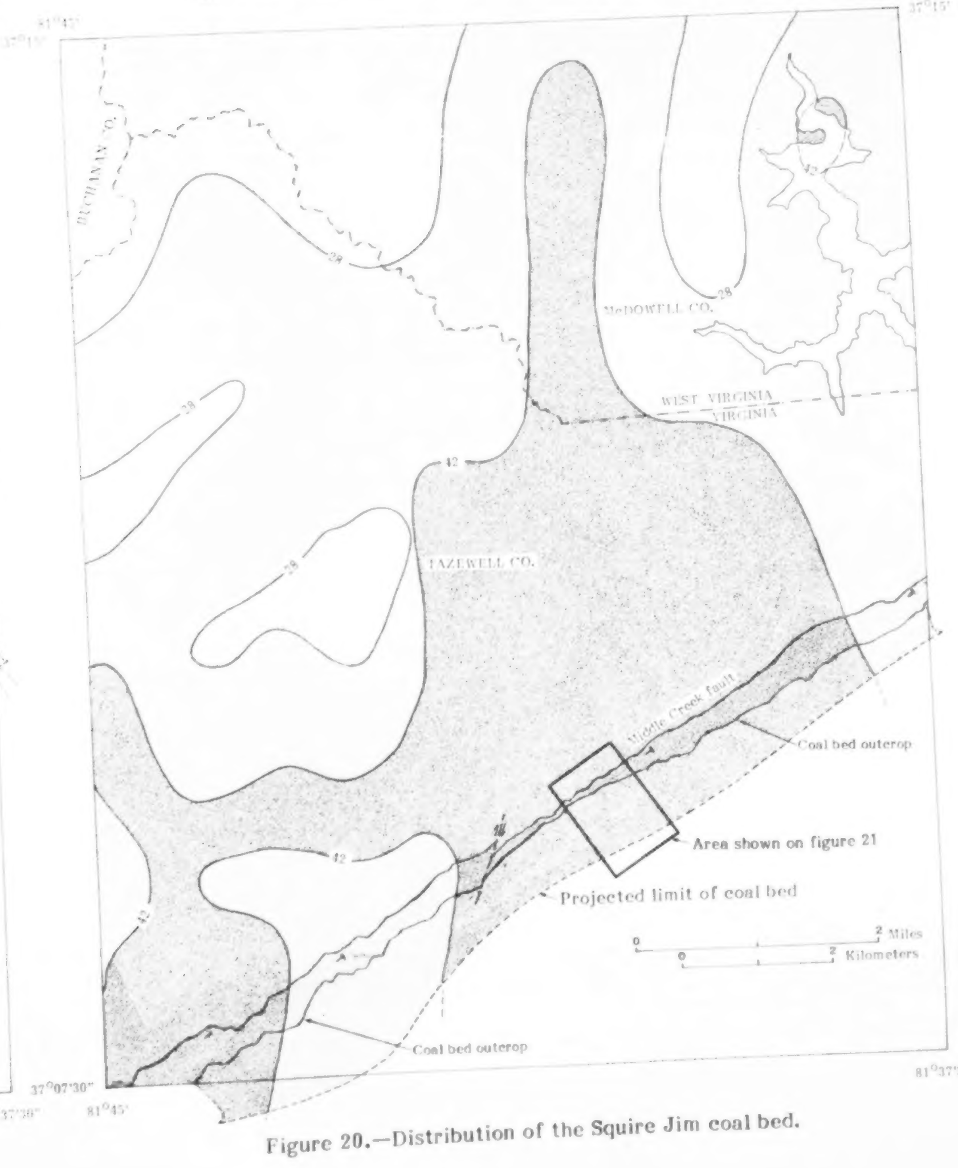


Figure 20.--Distribution of the Squire Jim coal bed.

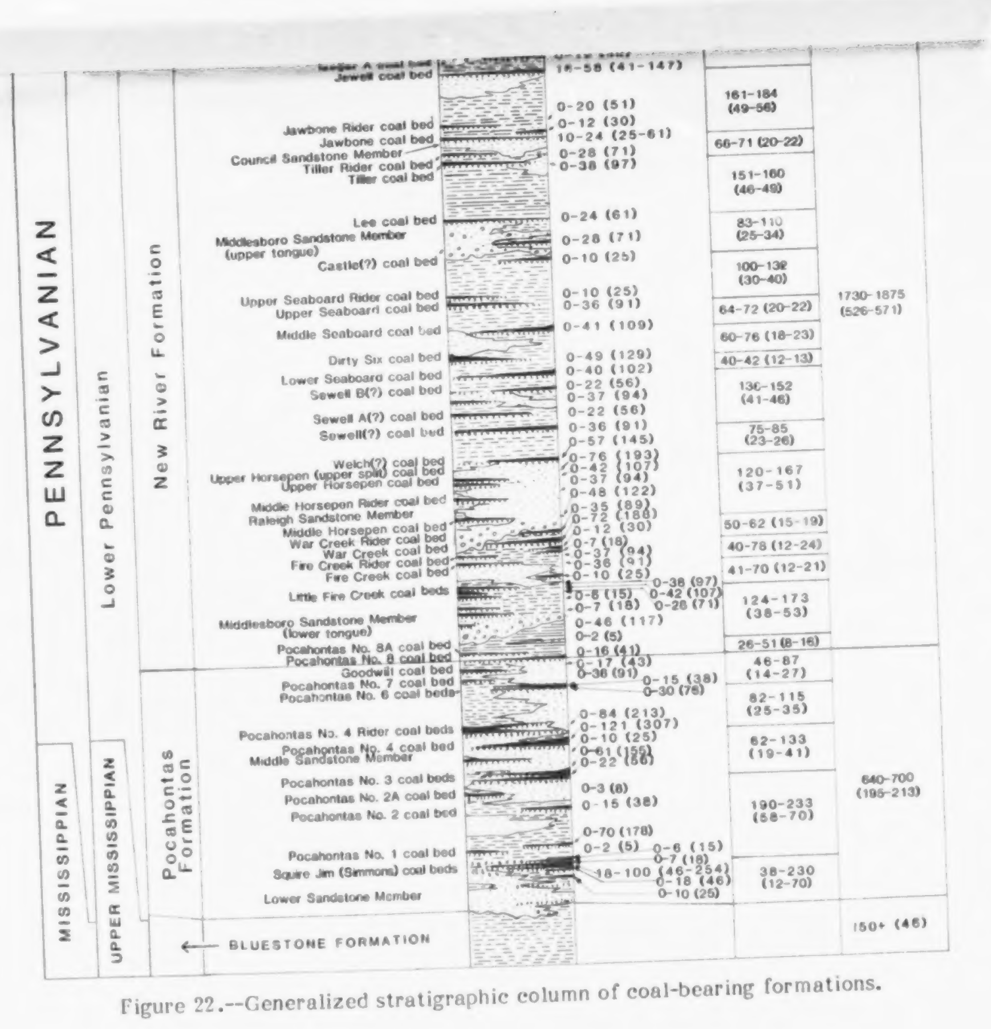


Figure 22.--Generalized stratigraphic column of coal-bearing formations.

Table 1.—*Estimated original and remaining coal resources in the Amonate, Va.-W.Va. quadrangle*
[In thousands of short tons, as of January 1981]

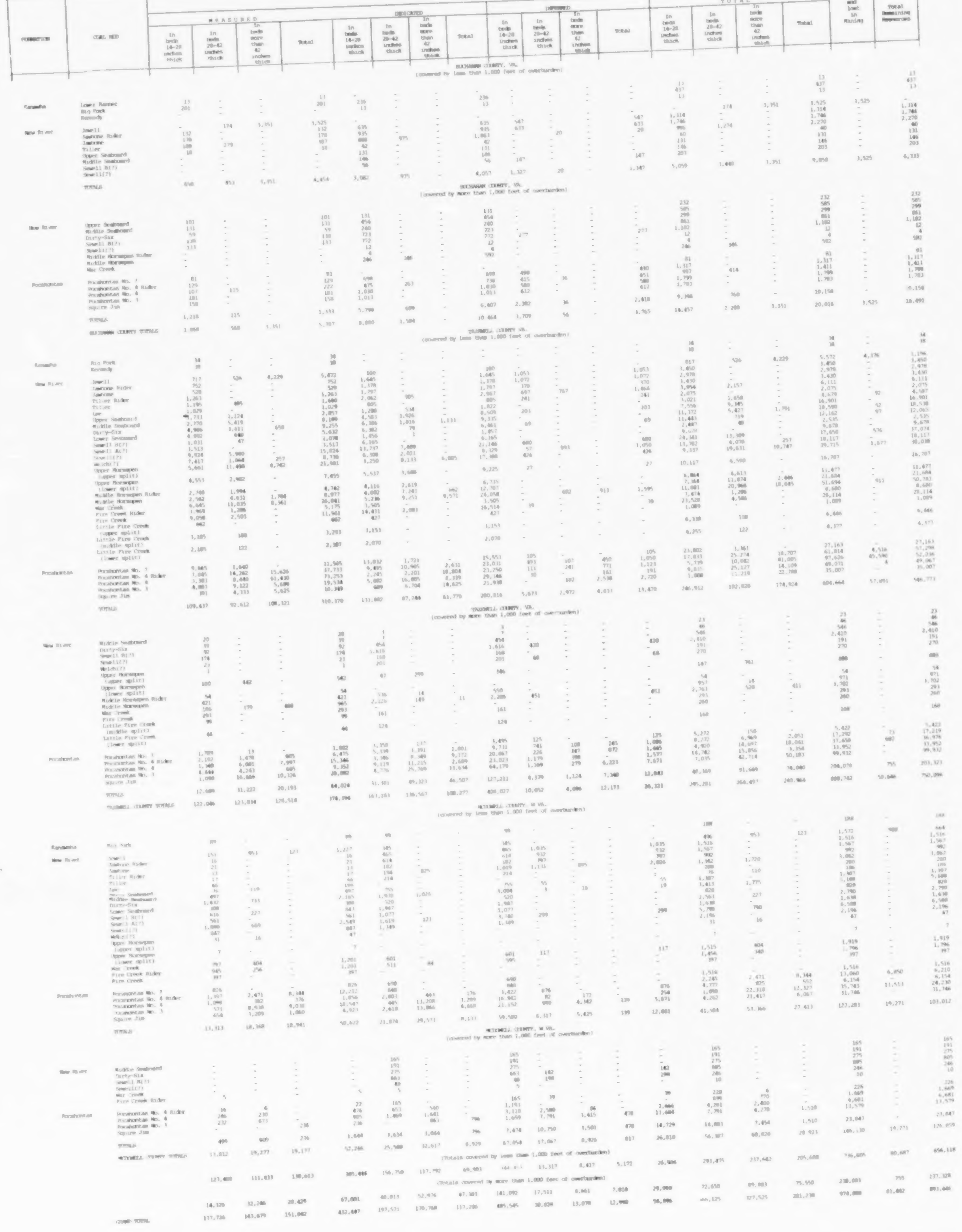
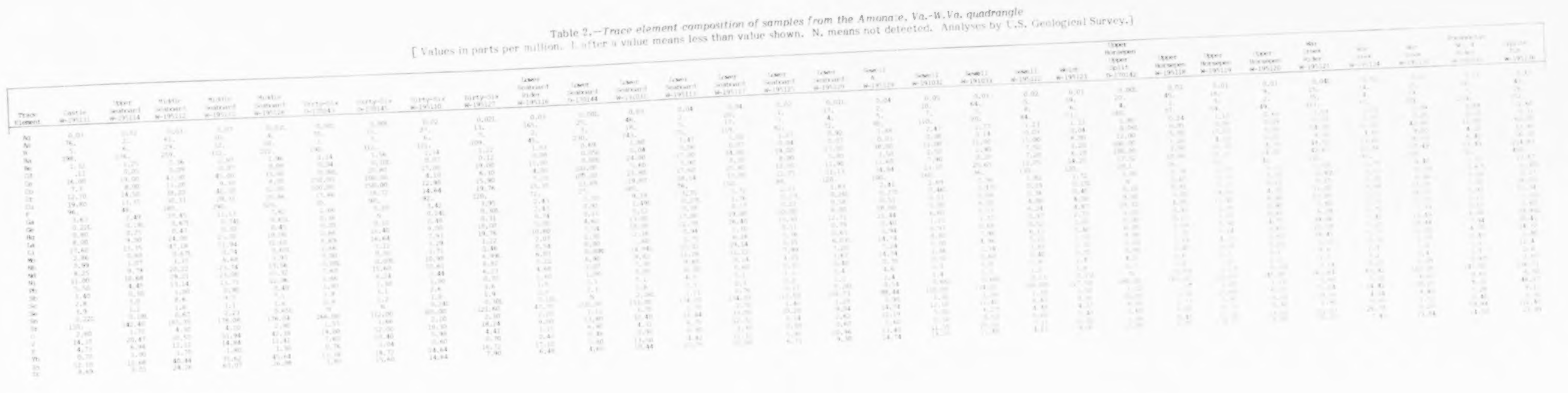


Table 2.—*Trace element composition of samples from the Amonate, Va.-W.Va. quadrangle*
[Values in parts per million. L after a value means less than value shown. N, means not detected. Analyses by U.S. Geological Survey.]



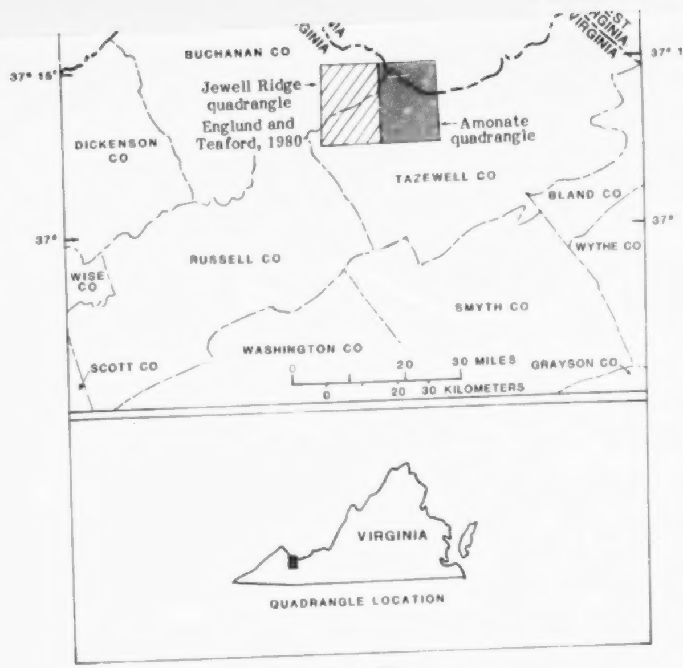
MAPS SHOWING COAL RESOURCES OF THE AMONATE QUADRANGLE, BUCHANAN AND TAZEWELL COUNTIES, VIRGINIA AND McDOWELL COUNTY, WEST VIRGINIA

By
John F. Windolph, Jr.
1986

The thickest coal overlies lobate sandstone beds of distributary delta systems (Englund, 1974, p. 43) Several coal beds have been extensively developed by underground, surface, and auger methods. Most of the production has been from the Pocahontas No. 3, No. 4, No. 4 Rider, Upper Horsepen, Sewell, and Jewell coal beds. Figures 1-20 show the distribution of coal resources of the major beds in the quadrangle. These should not be interpreted as geologic maps because folded and faulted portions of the coal beds south of the Middle Creek fault on figures 5-20 are depicted as if they were flat lying for purposes of resource calculations (fig. 21).

Approximately 3,150 feet (960 m) of coal-bearing rocks crop out in the quadrangle. These include the entire Pocahontas and New River Formations of Early Pennsylvanian age and the lower portion of the Kanawha Formation of Middle Pennsylvanian age. Figure 22 shows stratigraphic relations and thicknesses of the formations, coal beds, and intervening lithologies. Coal lithotypes are predominately thin- to thick-banded vitrinite, bright to dull attritus (mixed lithologies) containing minor fusinite bands, and sparsely disseminated pyrite and calcite. The Squire Jim and Dirty-Six coal beds contain numerous shale and underclay partings. Pocahontas coal is mostly fine cleated, whereas New River and Kanawha coals are medium to coarsely cleated. The coal field south of the Middle Creek fault has been deformed tectonically and a narrow belt of coal-bearing rocks is overturned, faulted, or asymmetrically folded. Coal beds in this belt have been sheared and crushed.

Thirty coal samples from 15 different beds were analyzed for trace elements (table 2) and major and minor oxide composition (table 3). Proximate and ultimate analyses for eight coal samples from five different beds are listed in table 4. The Middle Seaboard, War Creek Rider, and Squire Jim coal samples are high in trace element concentration and ash composition due to the inclusion of partings. The heating value for the Squire Jim coal, in parenthesis, was calculated as moisture and ash free. Most of the coal in the quadrangle is of high quality and is suitable for coke manufacture. Analyses of the samples, on an as-received basis, show that most of the coal is low to moderately high in ash (less than 9 percent), low to moderate in sulfur (less than 1 percent), and high in heating value (greater than 14,000 Btu/pound). No significant amounts of potentially toxic or economically valuable trace elements were found in the samples. Coal resources were calculated according to U.S. Geological Survey Bulletin 1450-B (1976). Analytical data are available from the National Coal Resource Data System (NCRDS).



Index Map

Table 3.—*Major and minor oxide composition of the laboratory ash of coal samples from the Amonate, Va.-W.Va. quadrangle*
[Values in percent. L after a value means less than shown. Analyses by U.S. Geological Survey.]

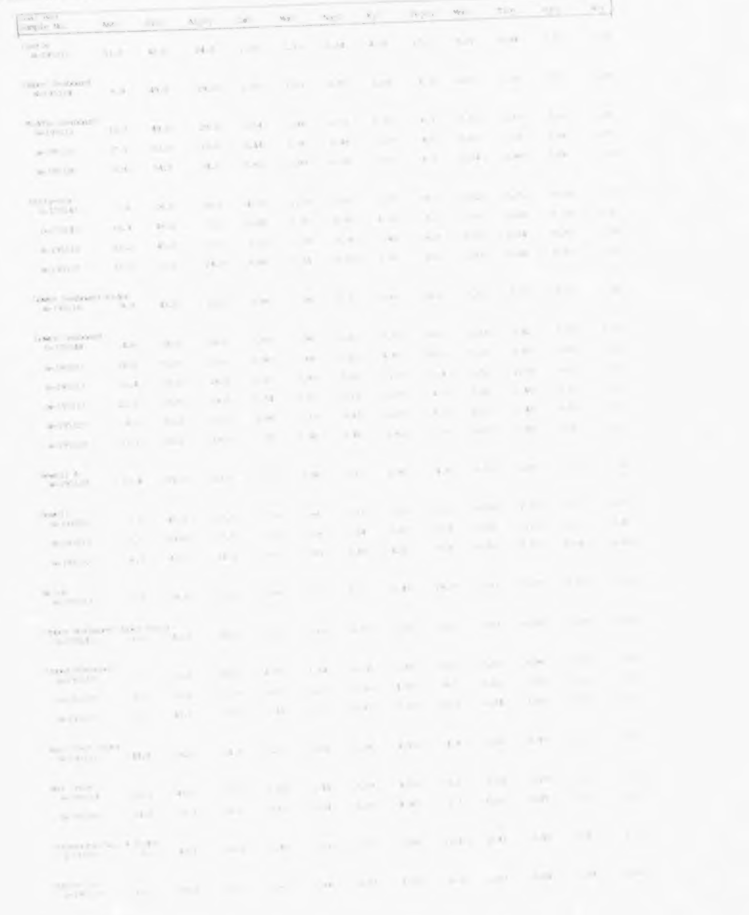
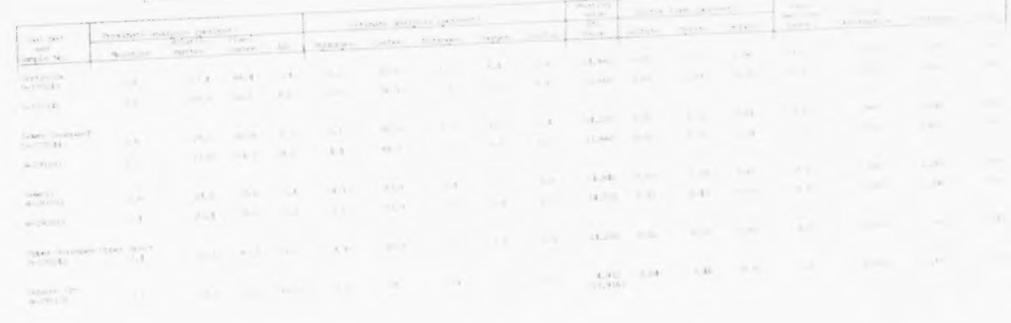


Table 4.—*Proximate and ultimate analyses of samples from the Amonate, Va.-W.Va. quadrangle*
[Analyses are on as-received basis. Channel samples by U.S. Geological Survey. Analyses by U.S. Bureau of Mines.]



INTERIOR—GEOLOGICAL SURVEY, RESTON, VA—1986
For sale by Branch of Distribution, U.S. Geological Survey
1200 South Eads Street, Arlington, VA 22202